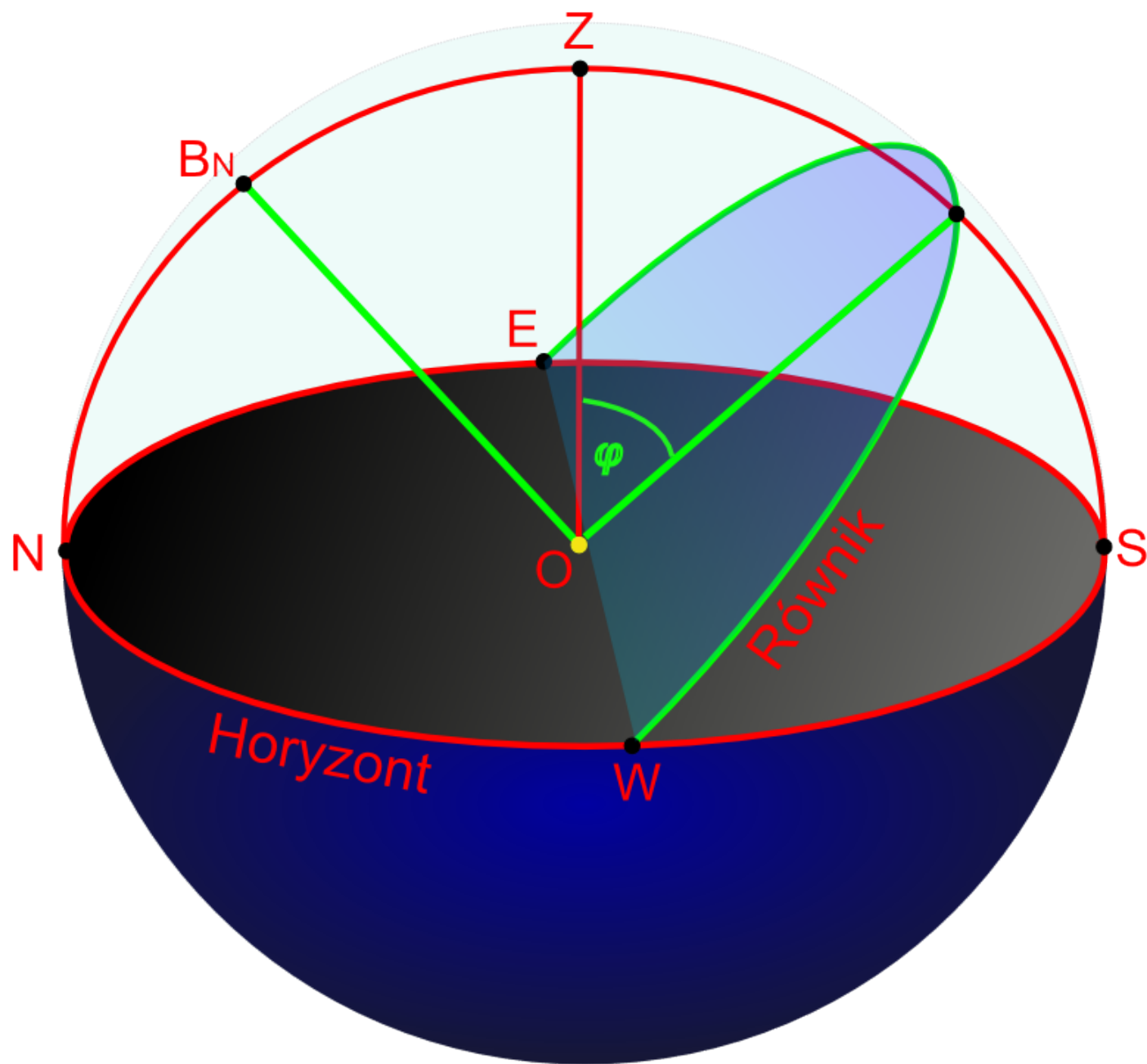


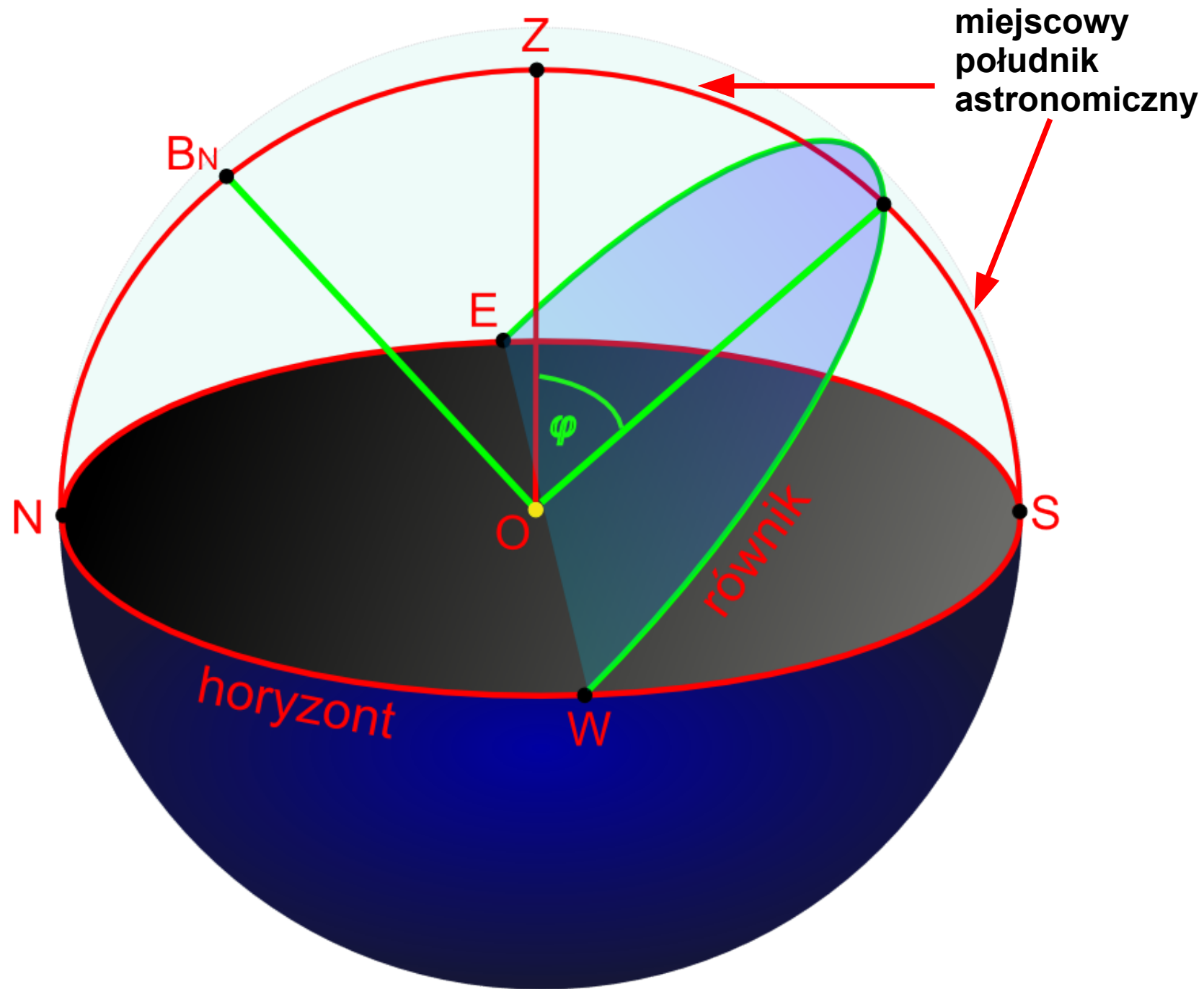
Wykład udostępniam na licencji Creative Commons:



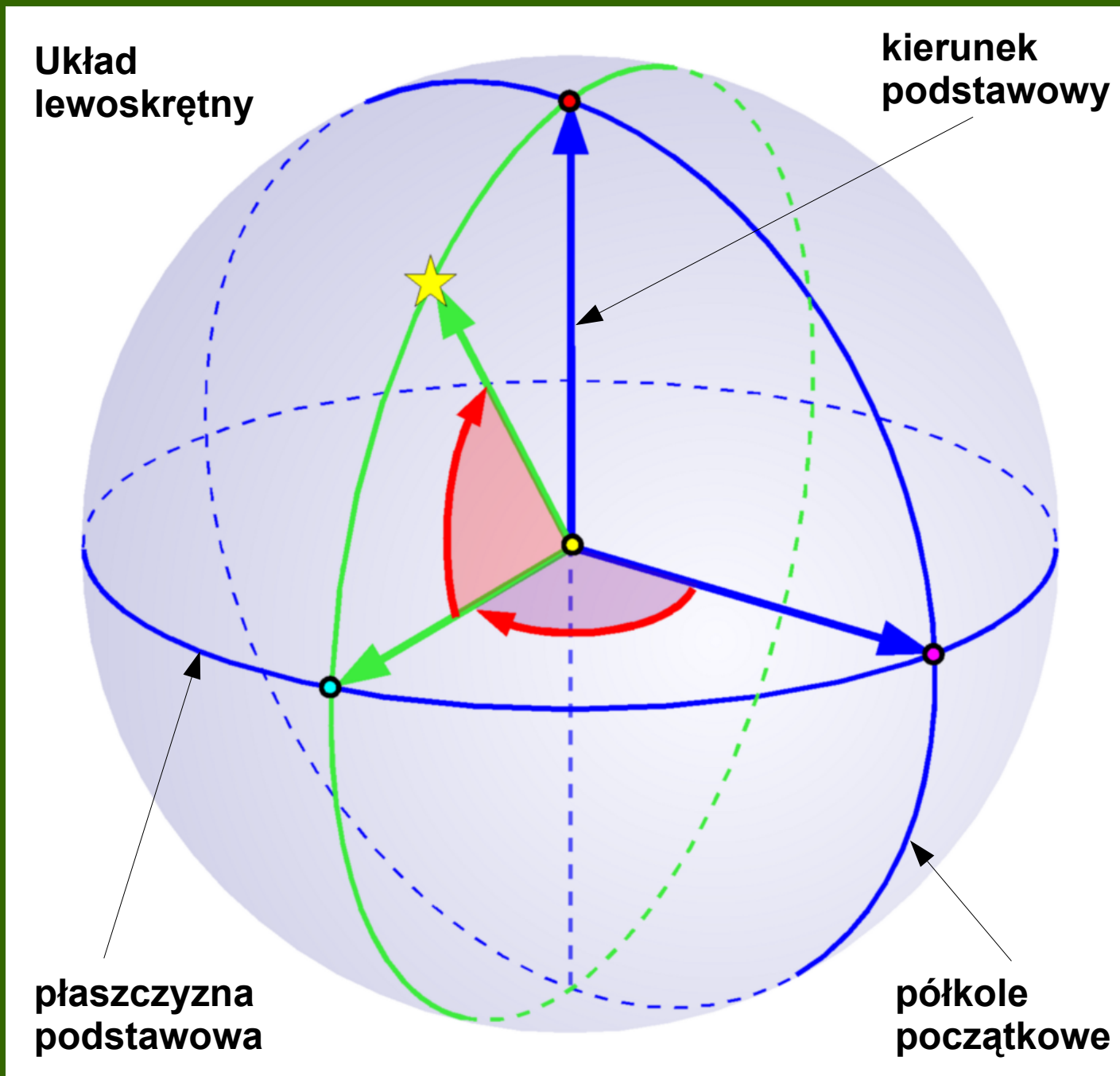
Układy współrzędnych sferycznych

Piotr A. Dybczyński

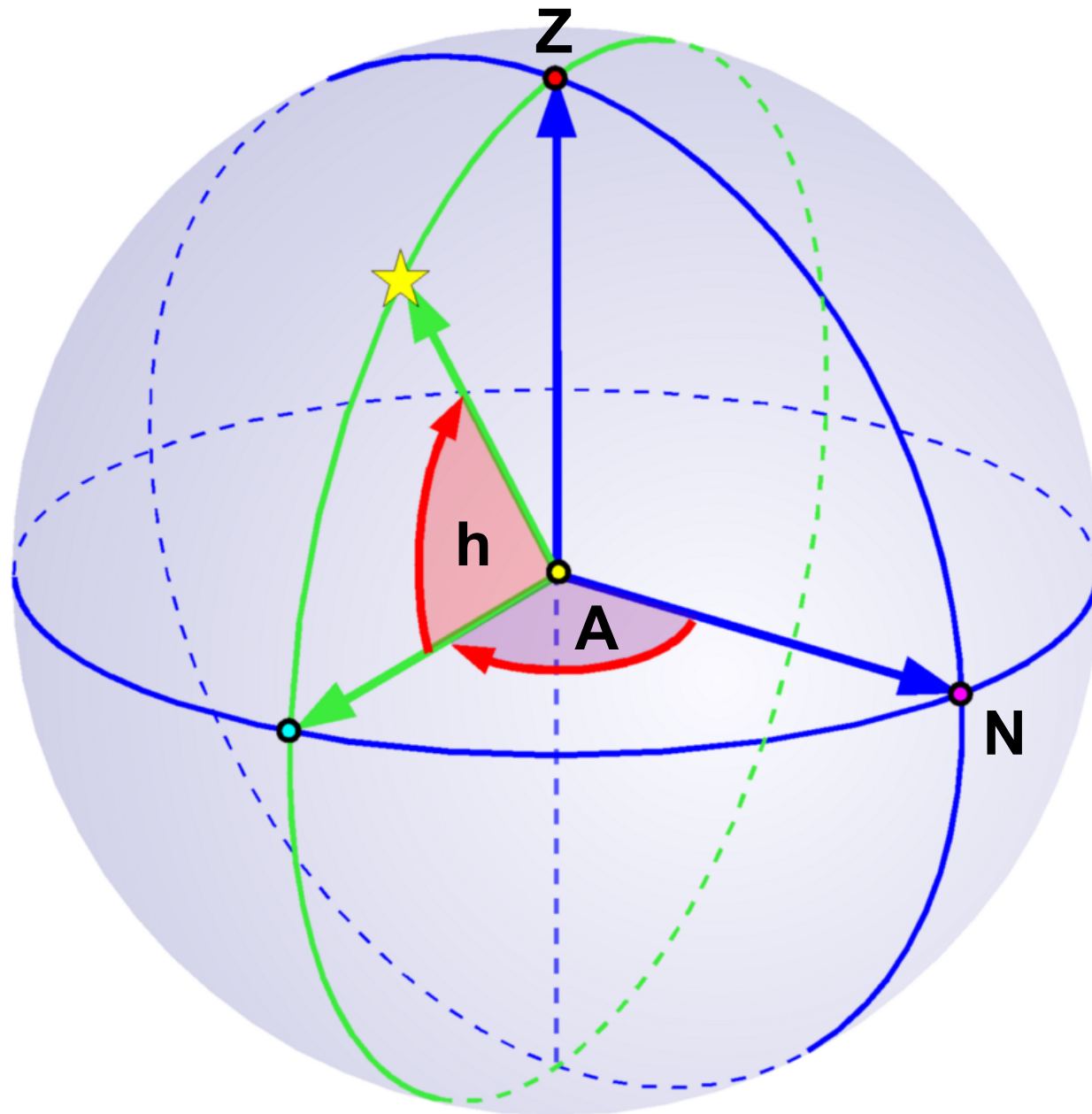




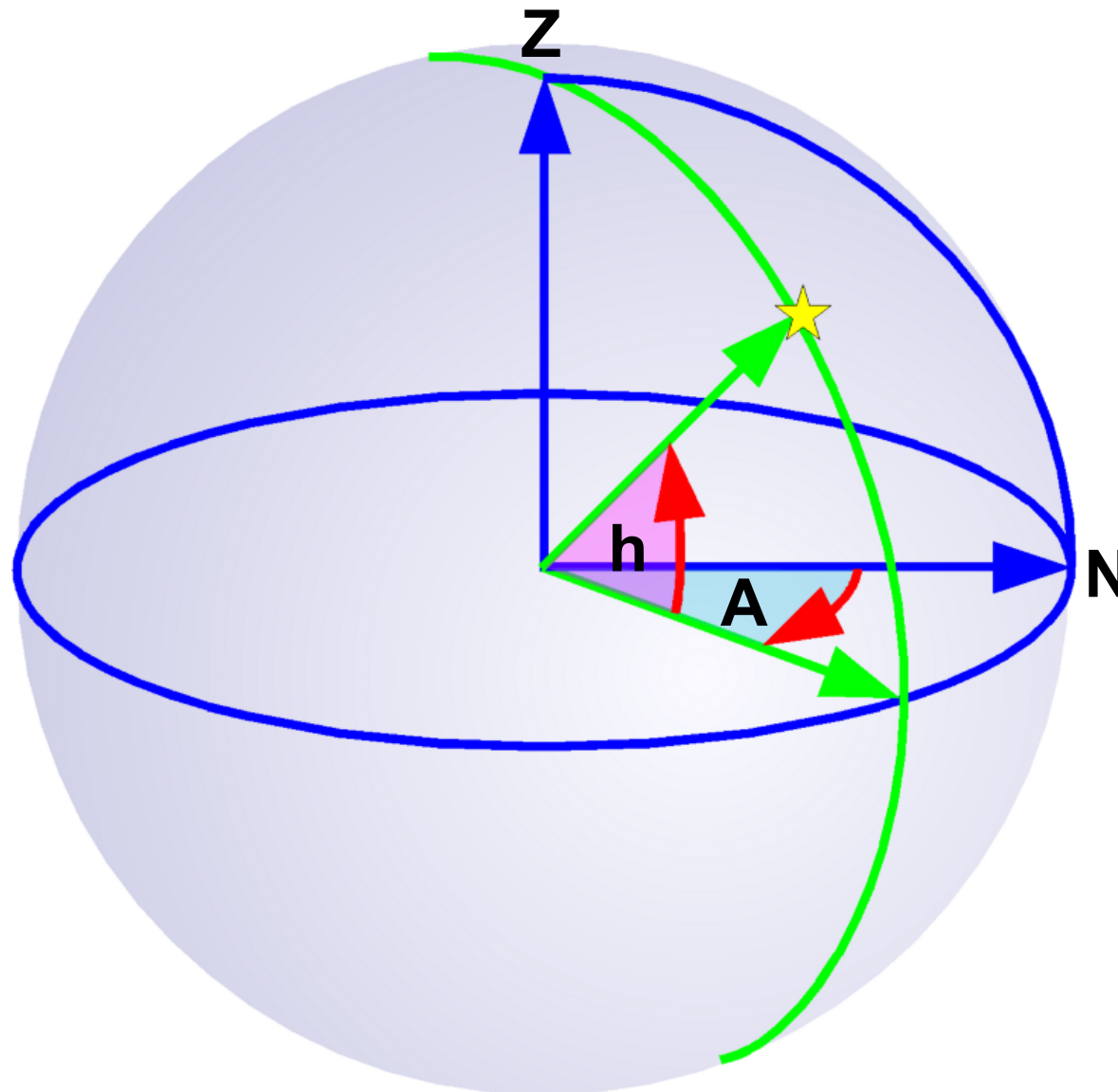
Współrzędne sferyczne



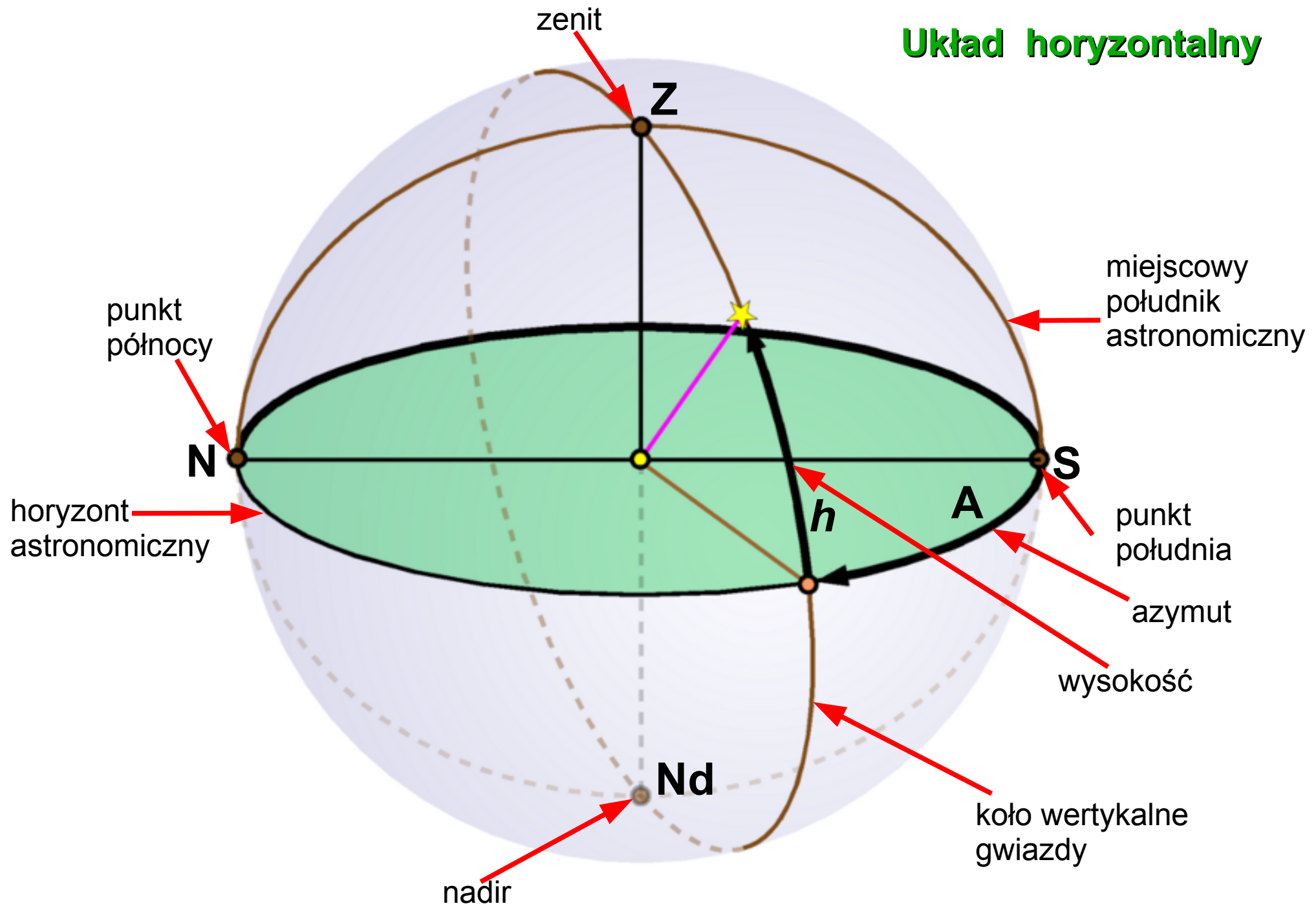
Układ horyzontalny

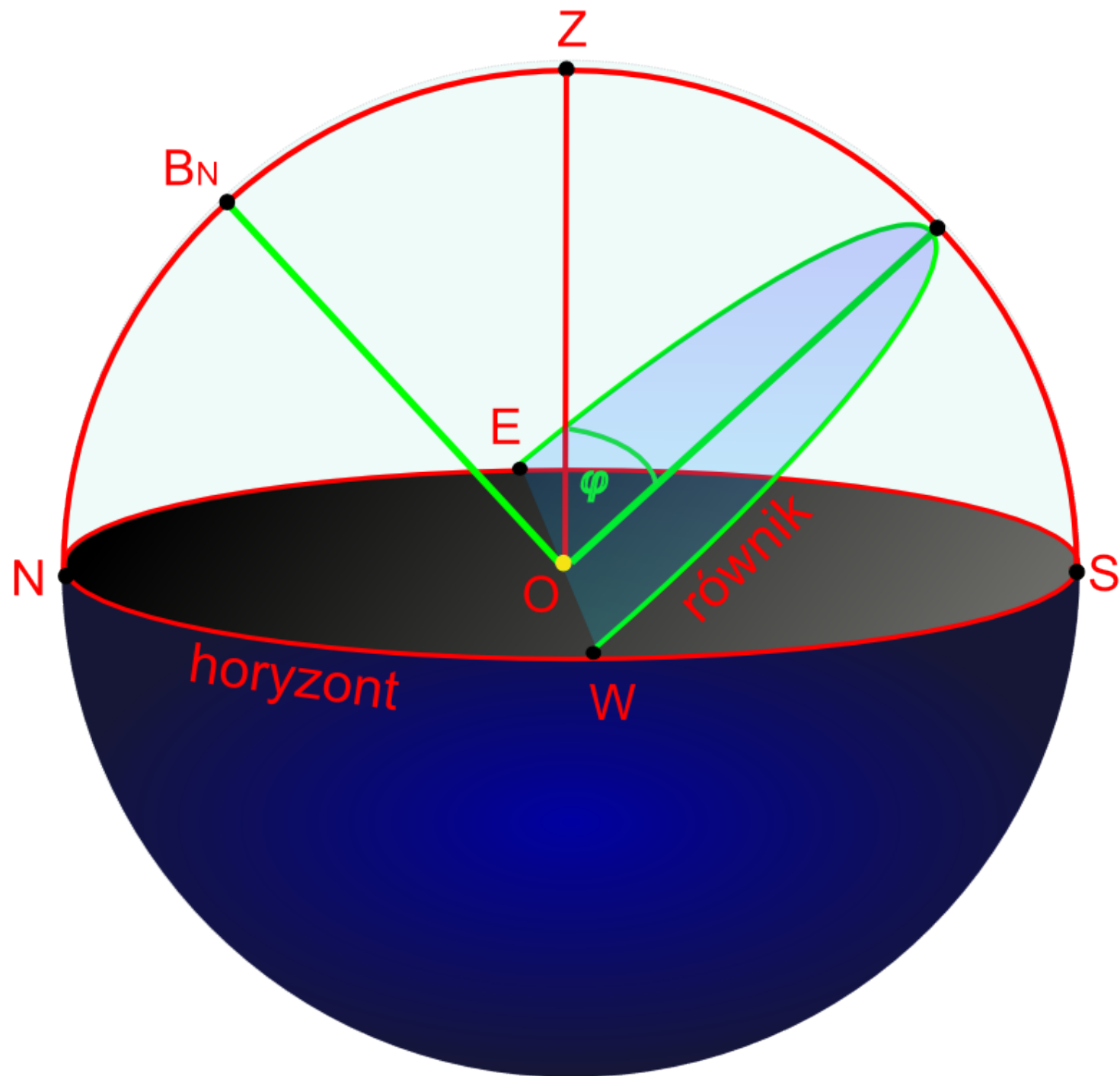


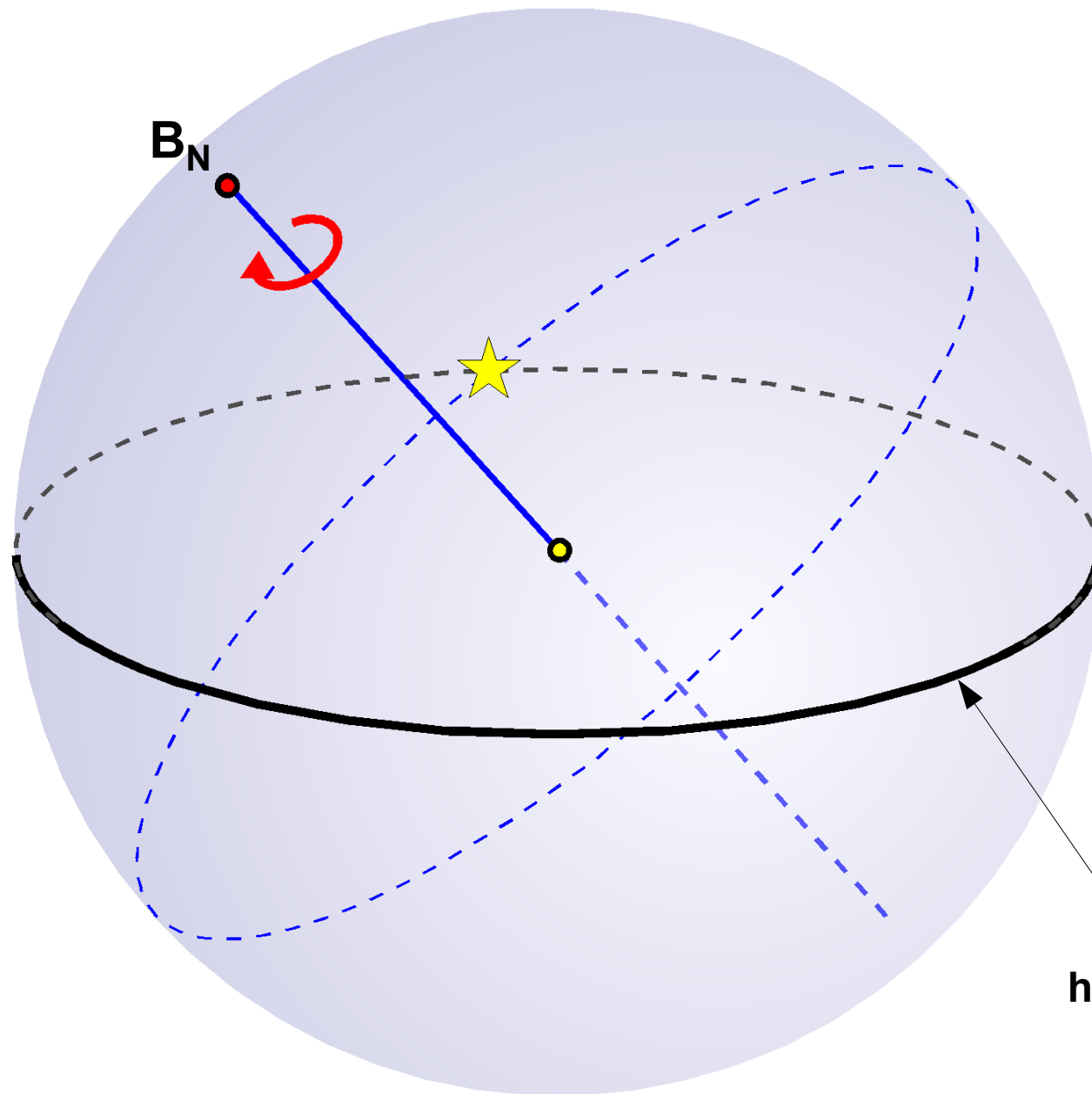
Układ horyzontalny



Układ horyzontalny

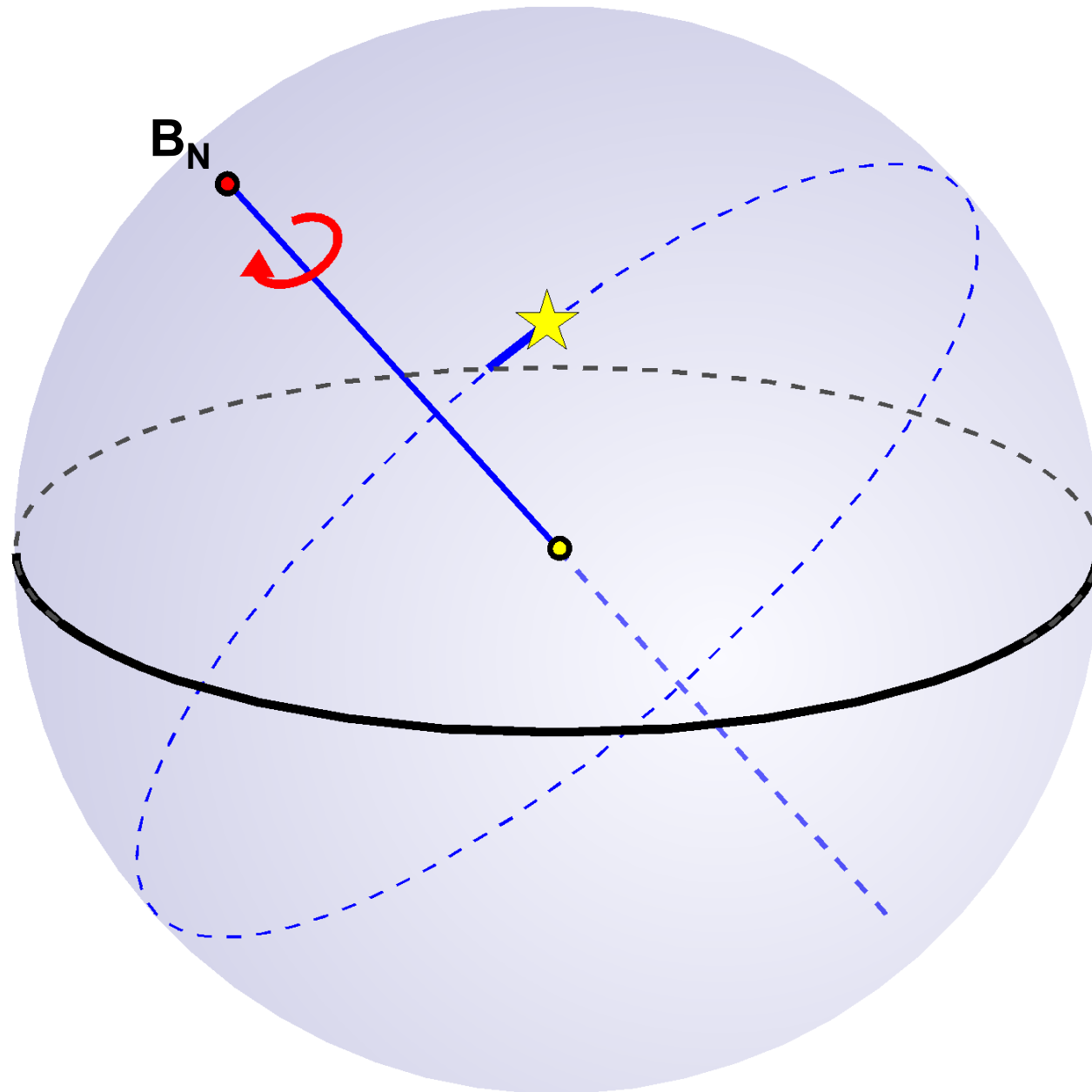


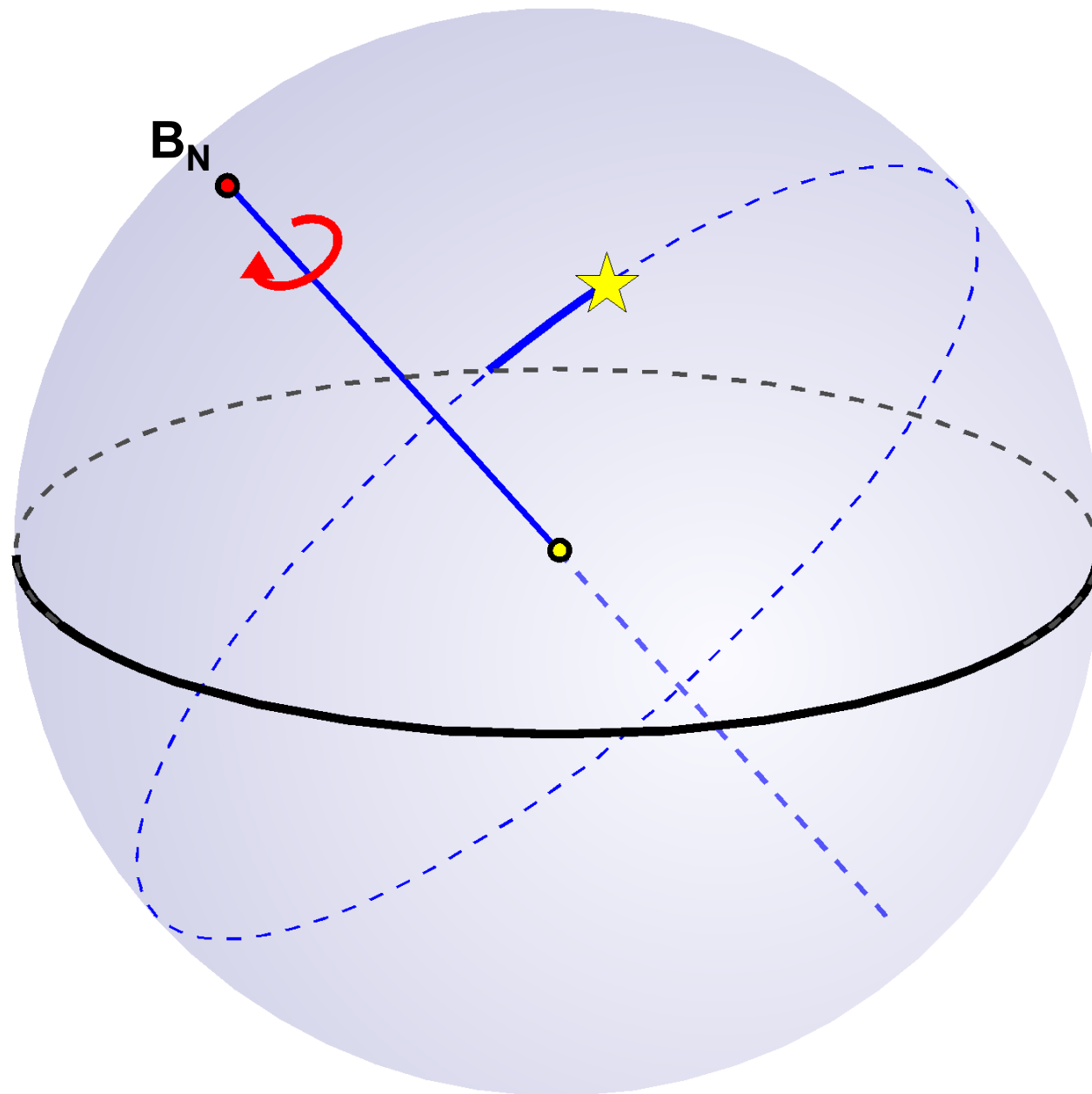


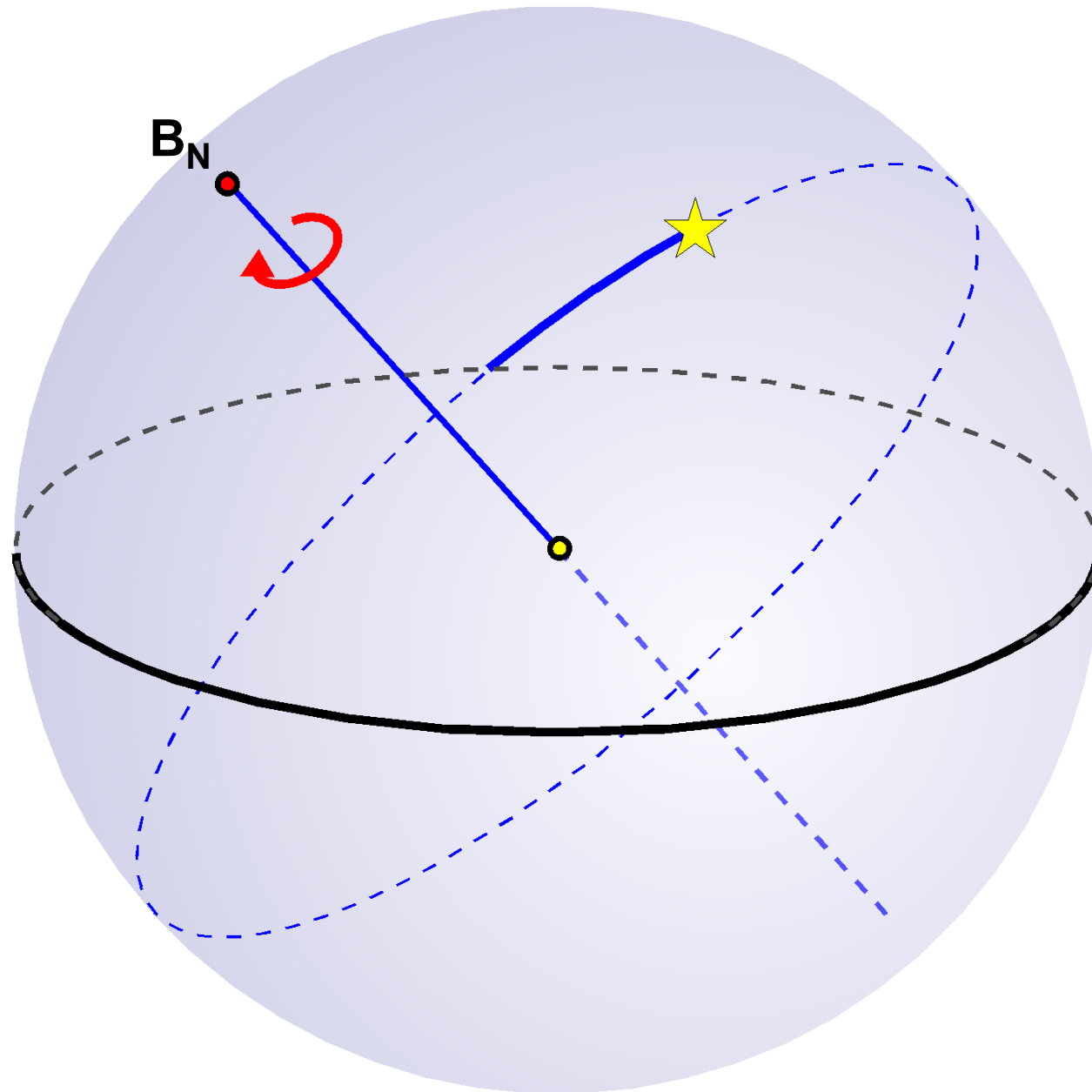


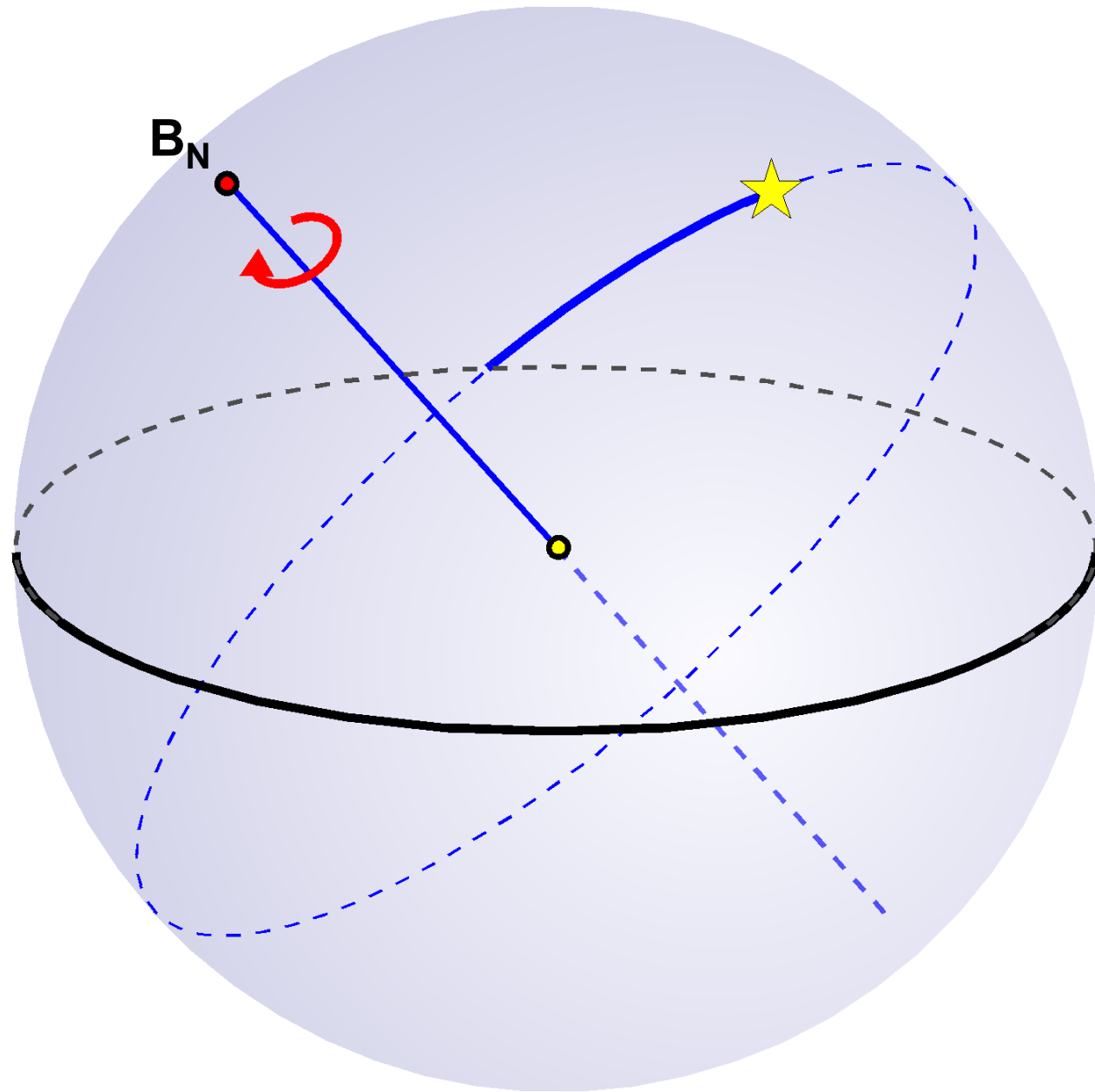
Wschód

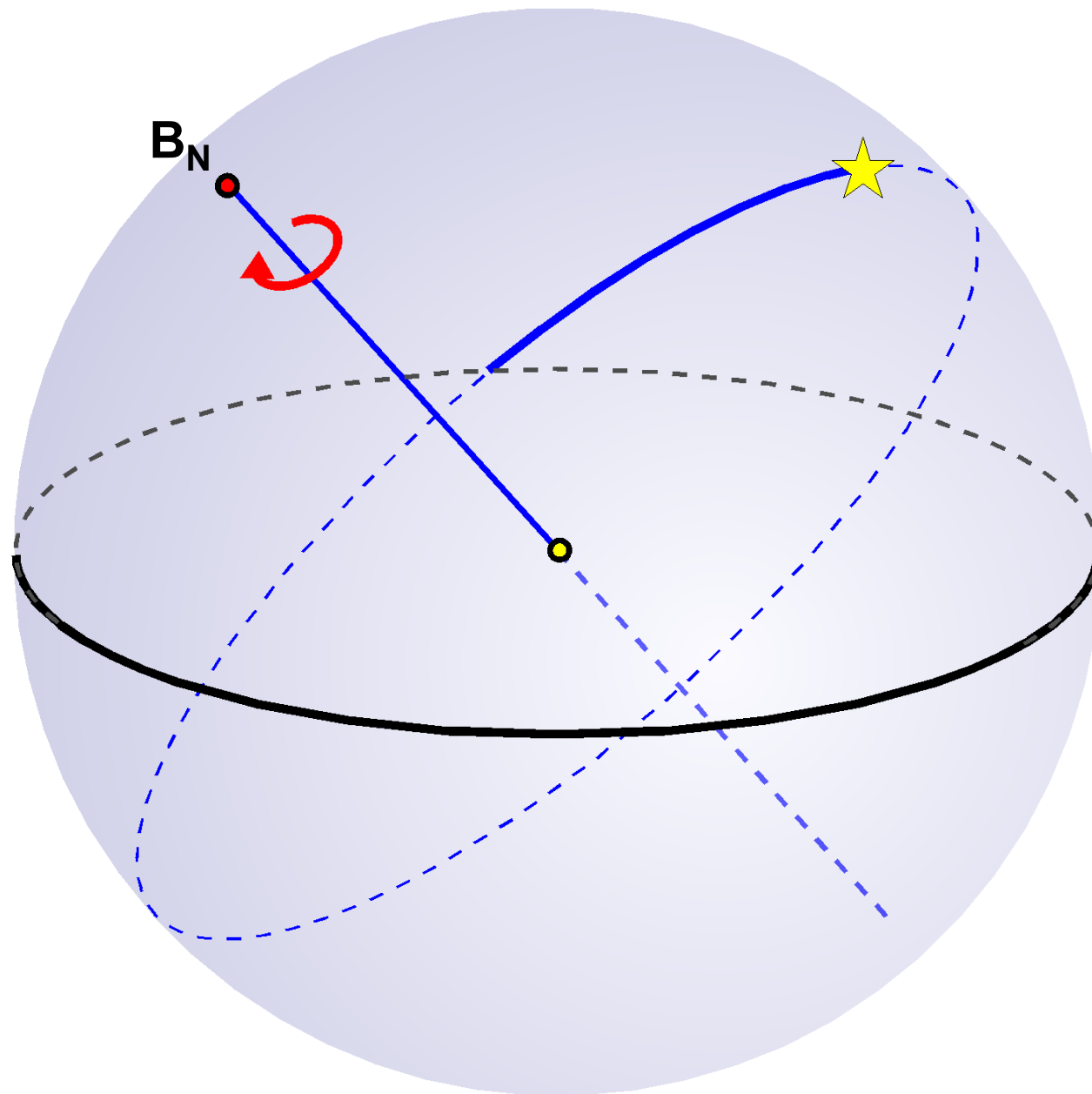
horyzont

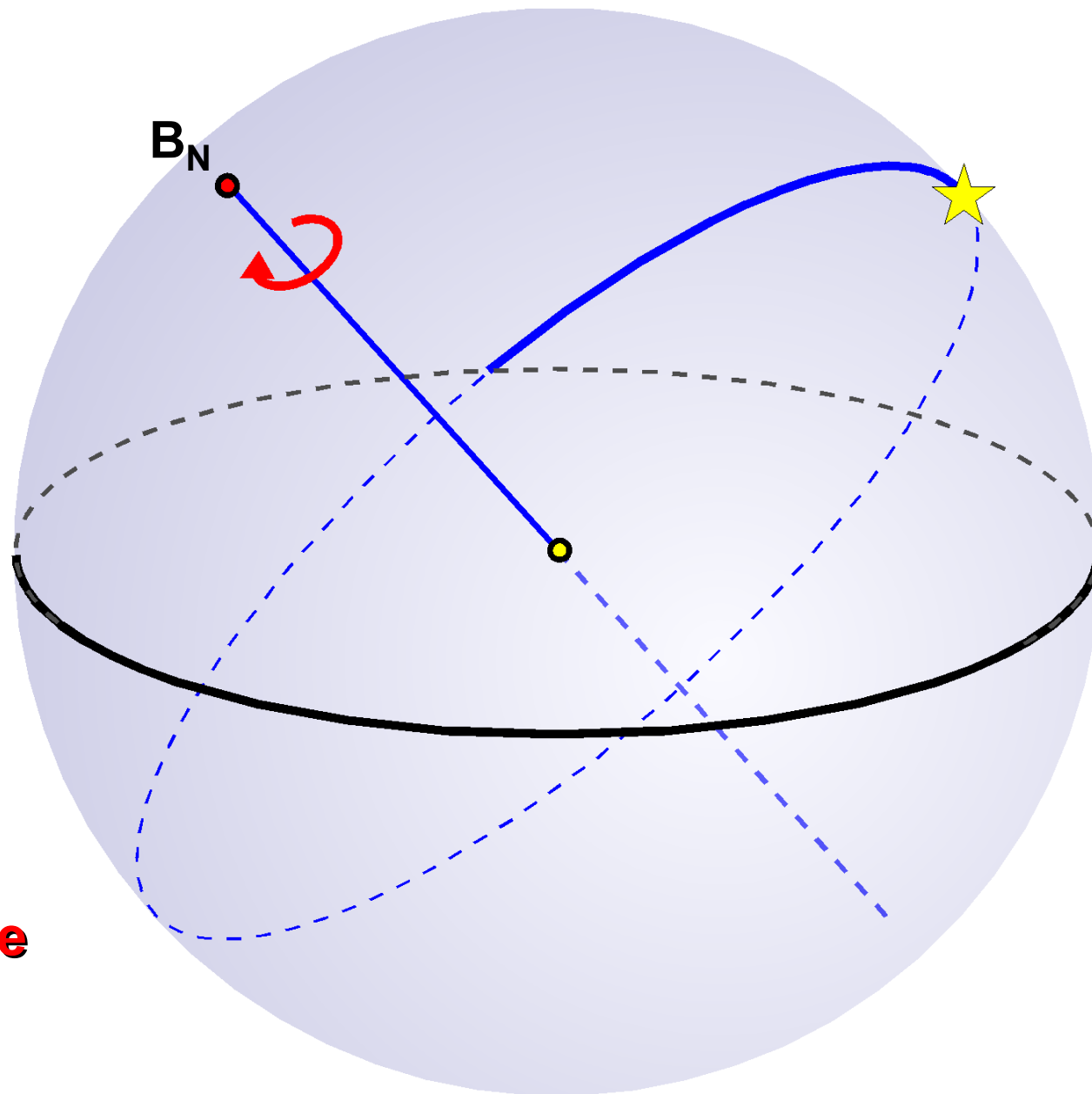




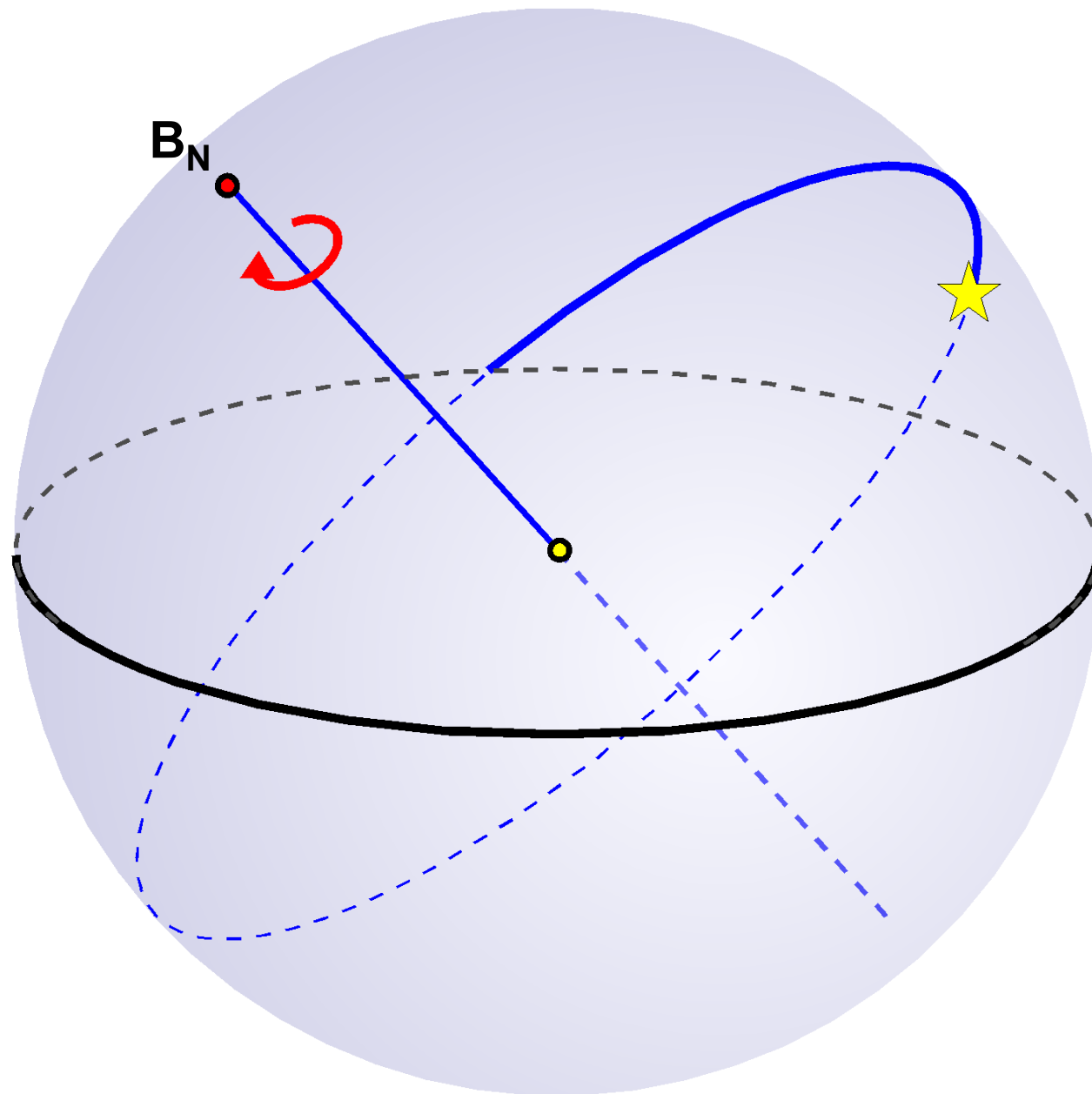


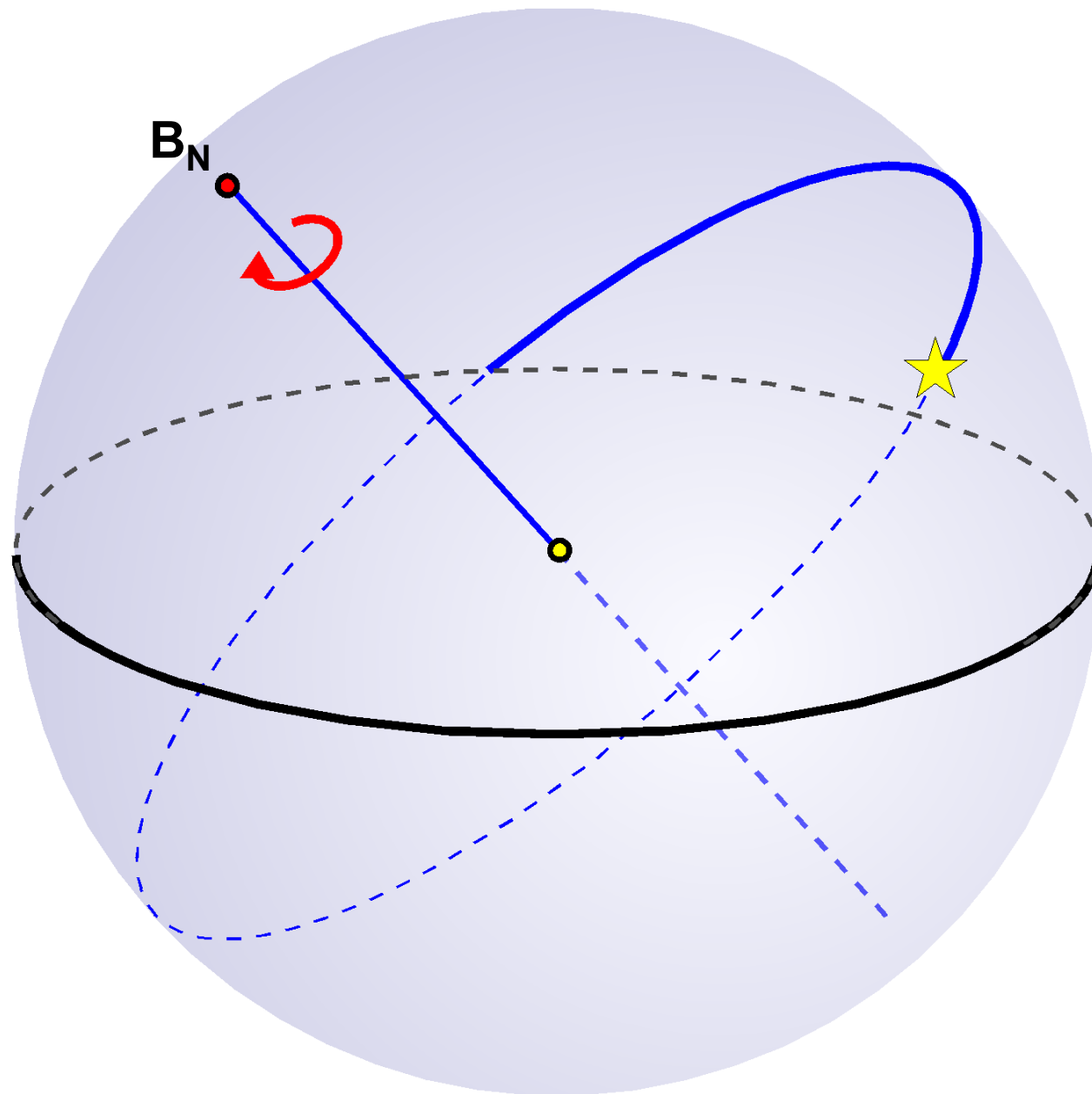


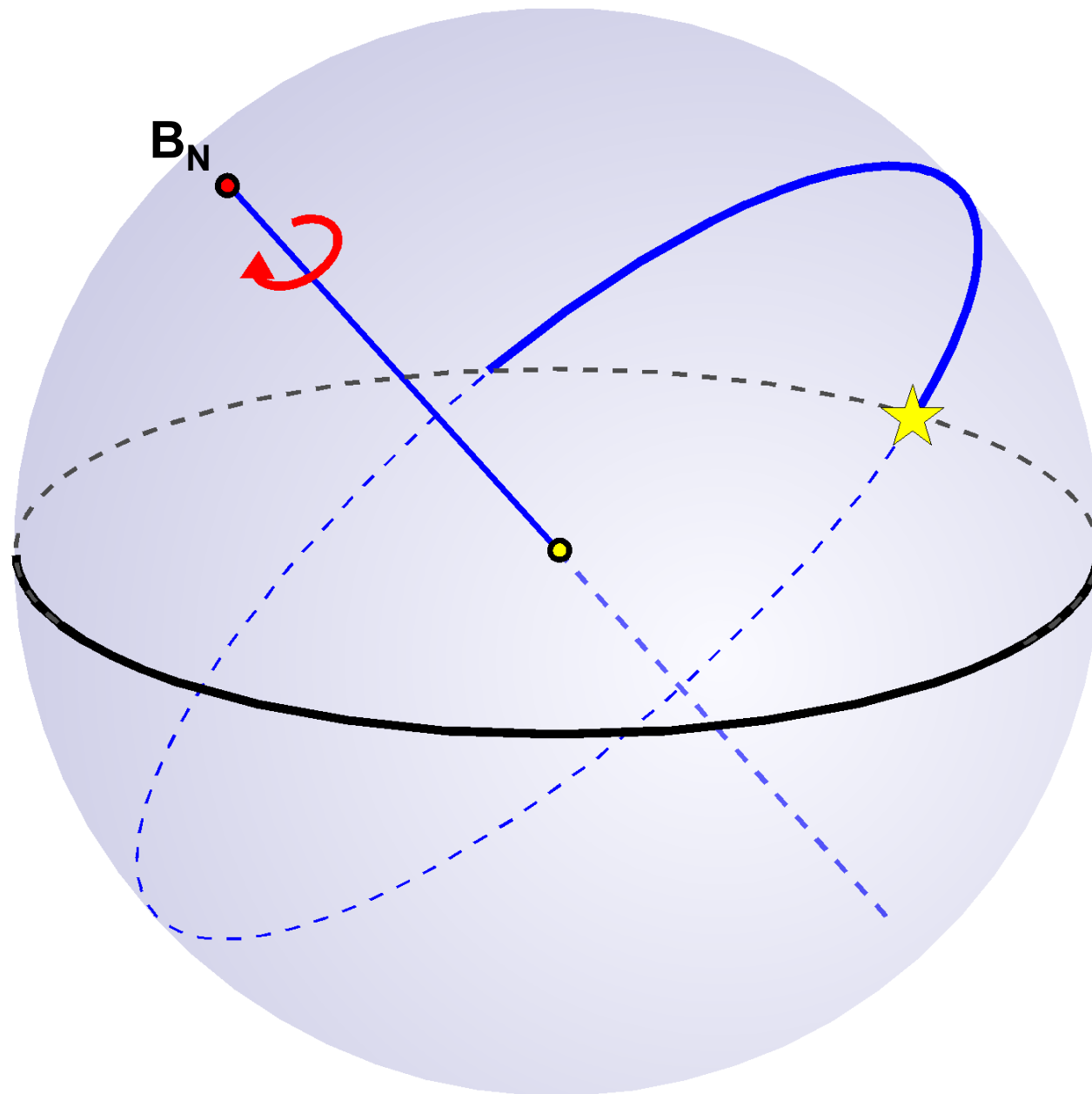


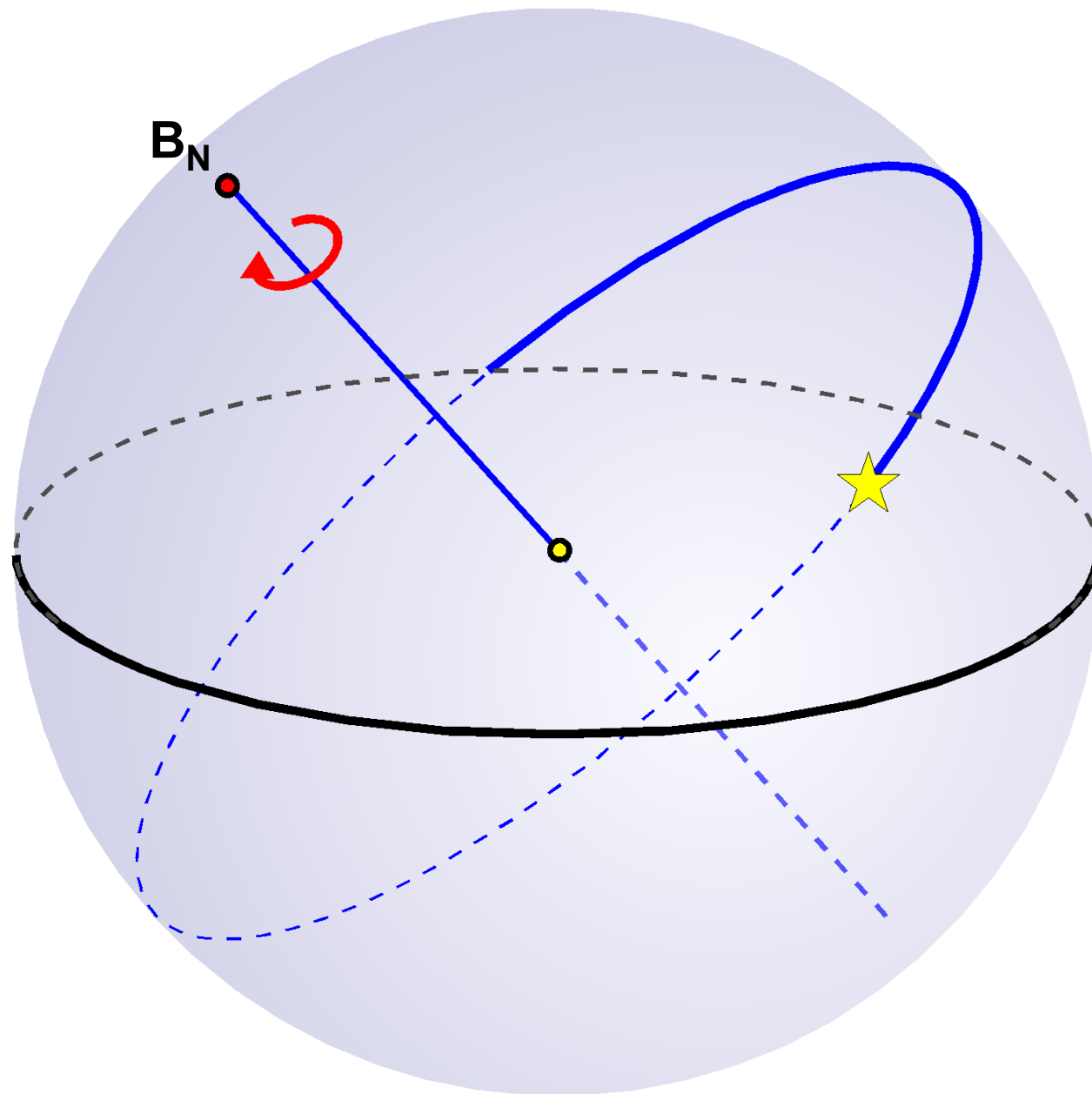


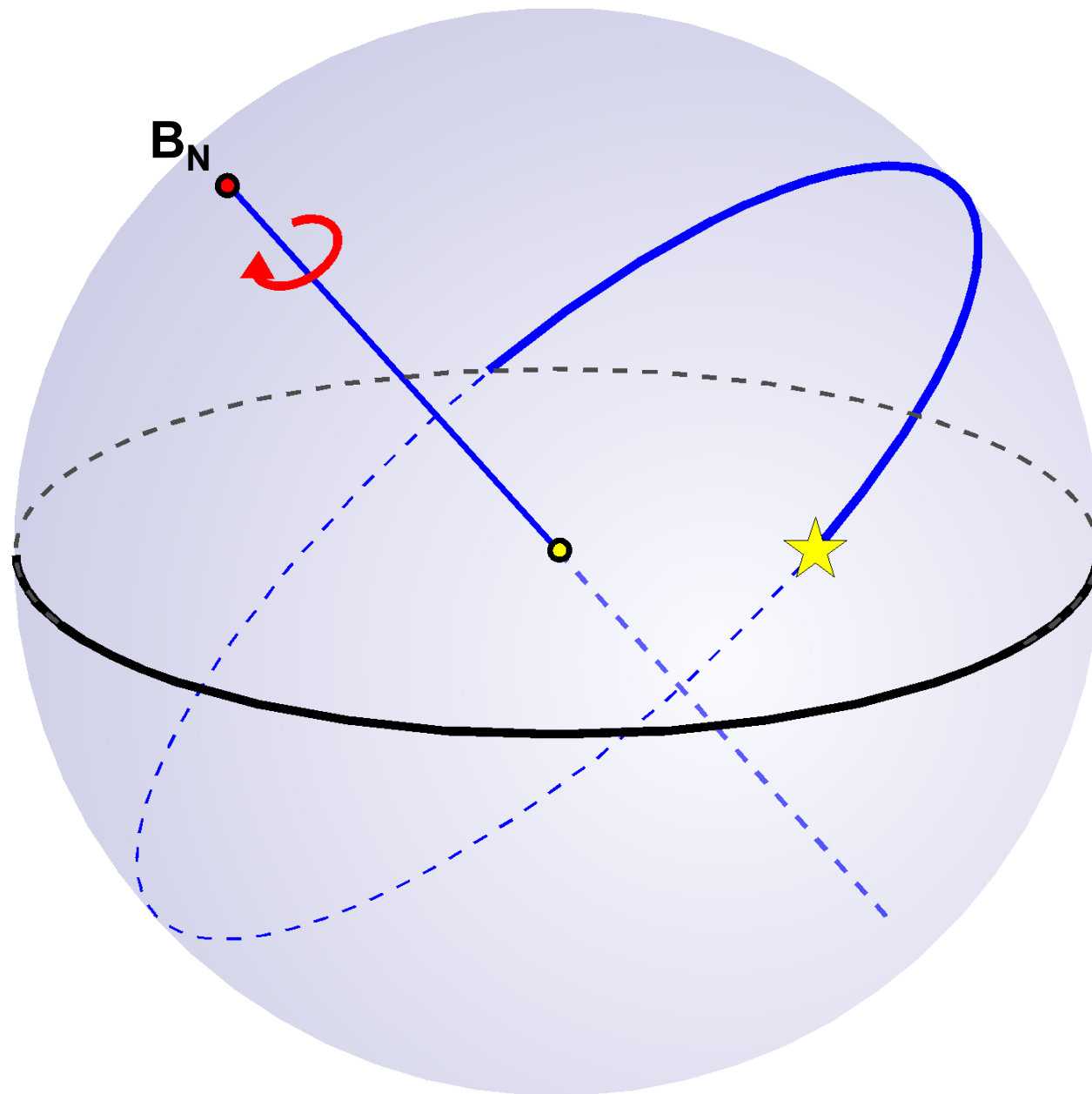
Górowanie

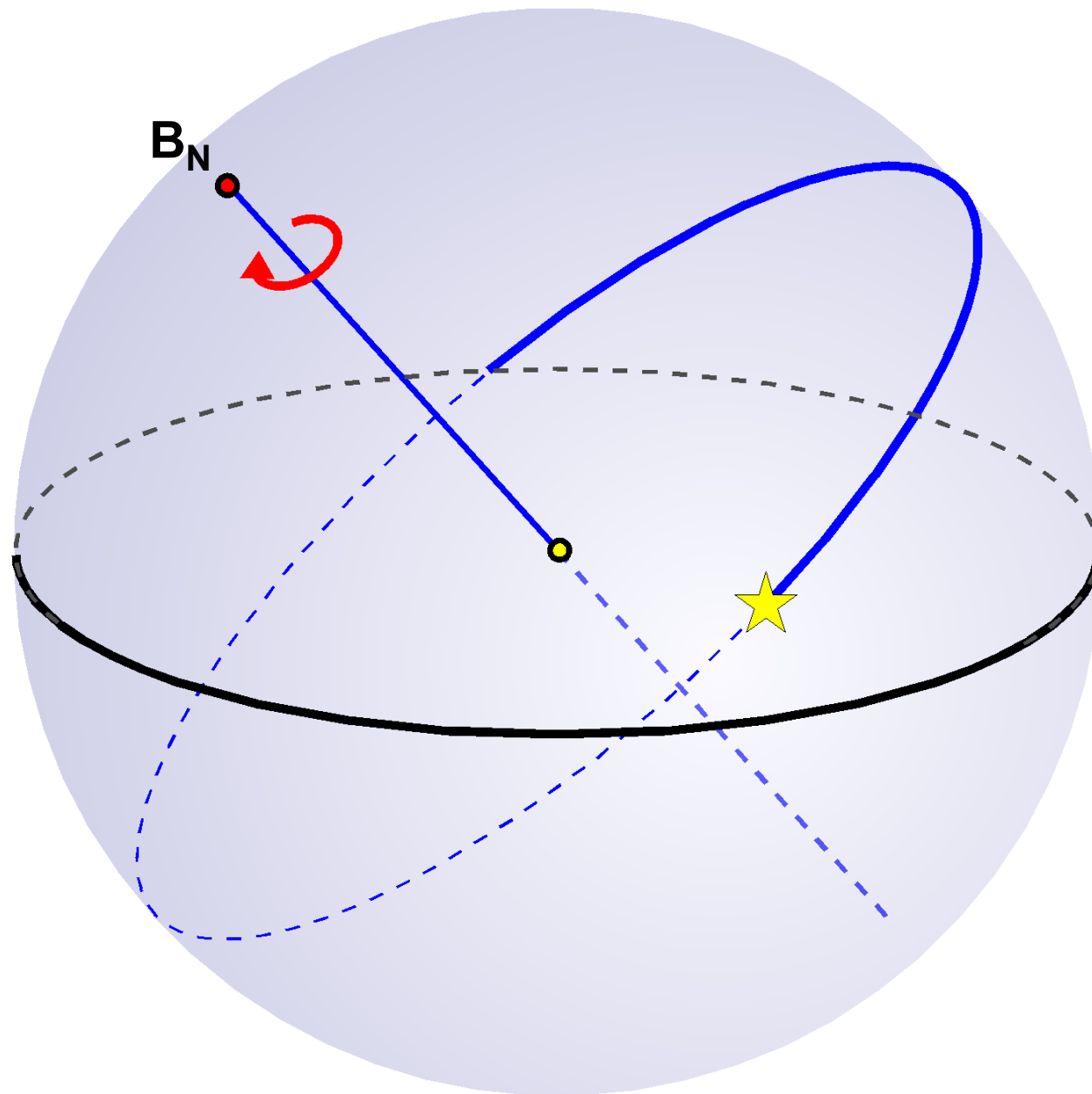


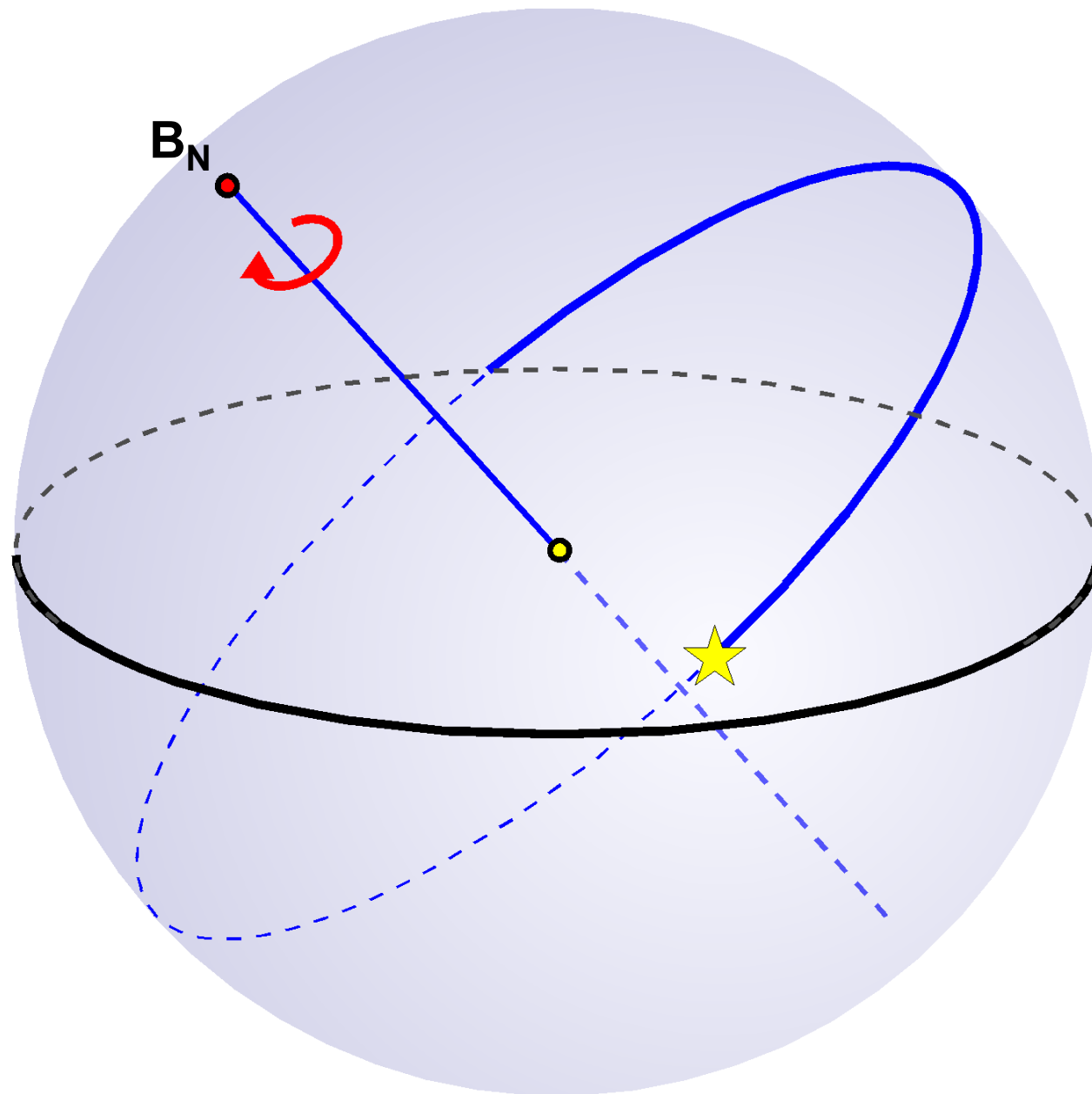


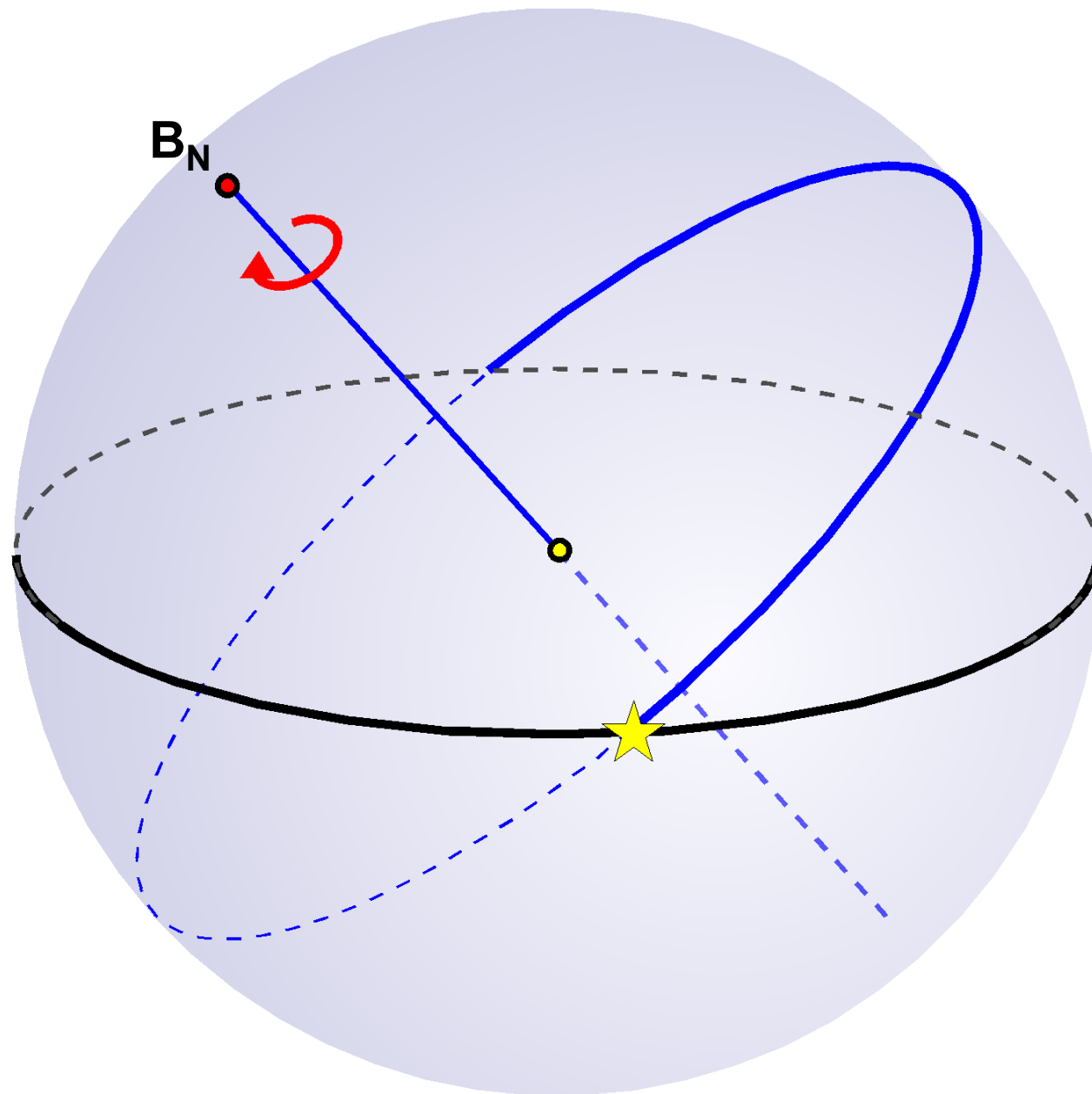




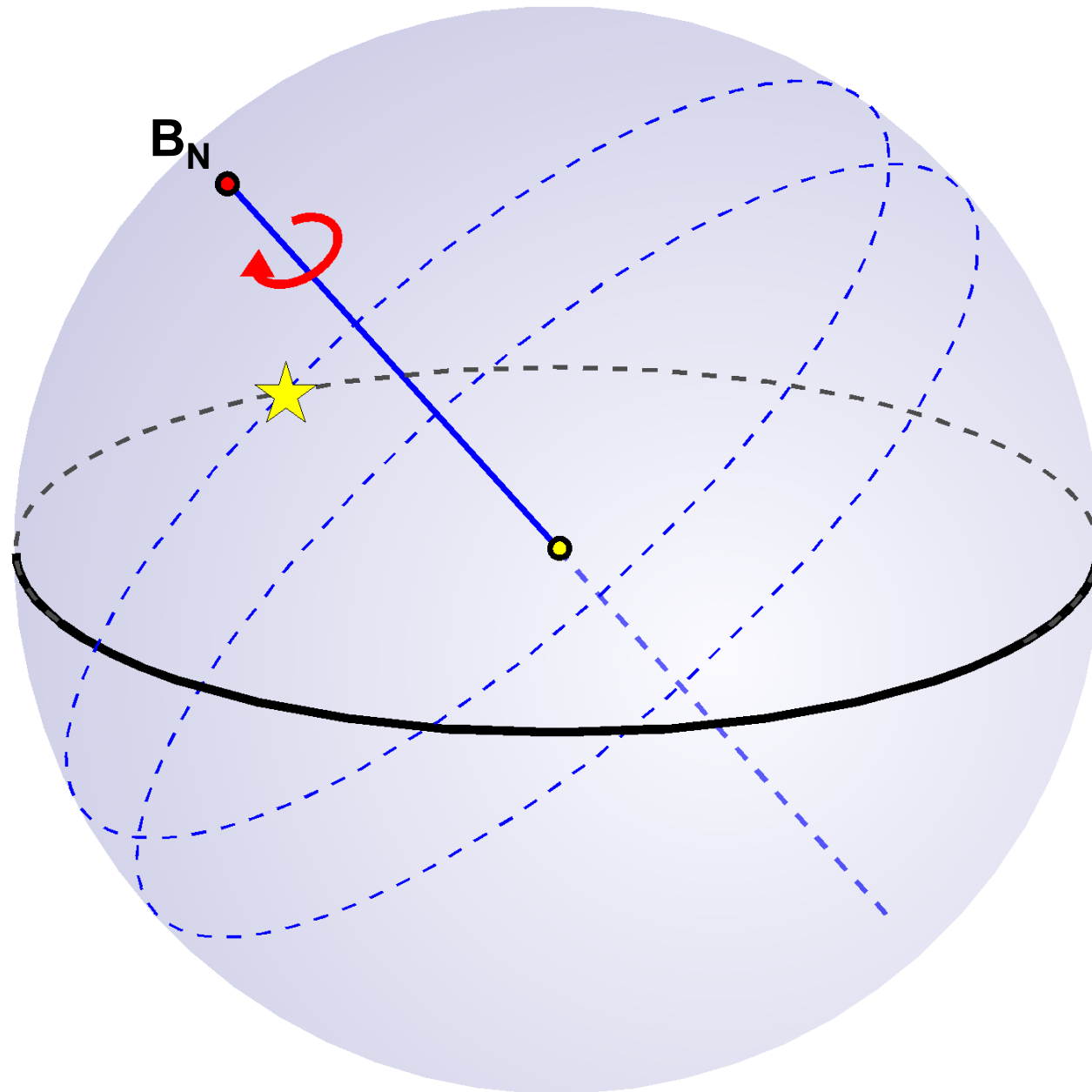




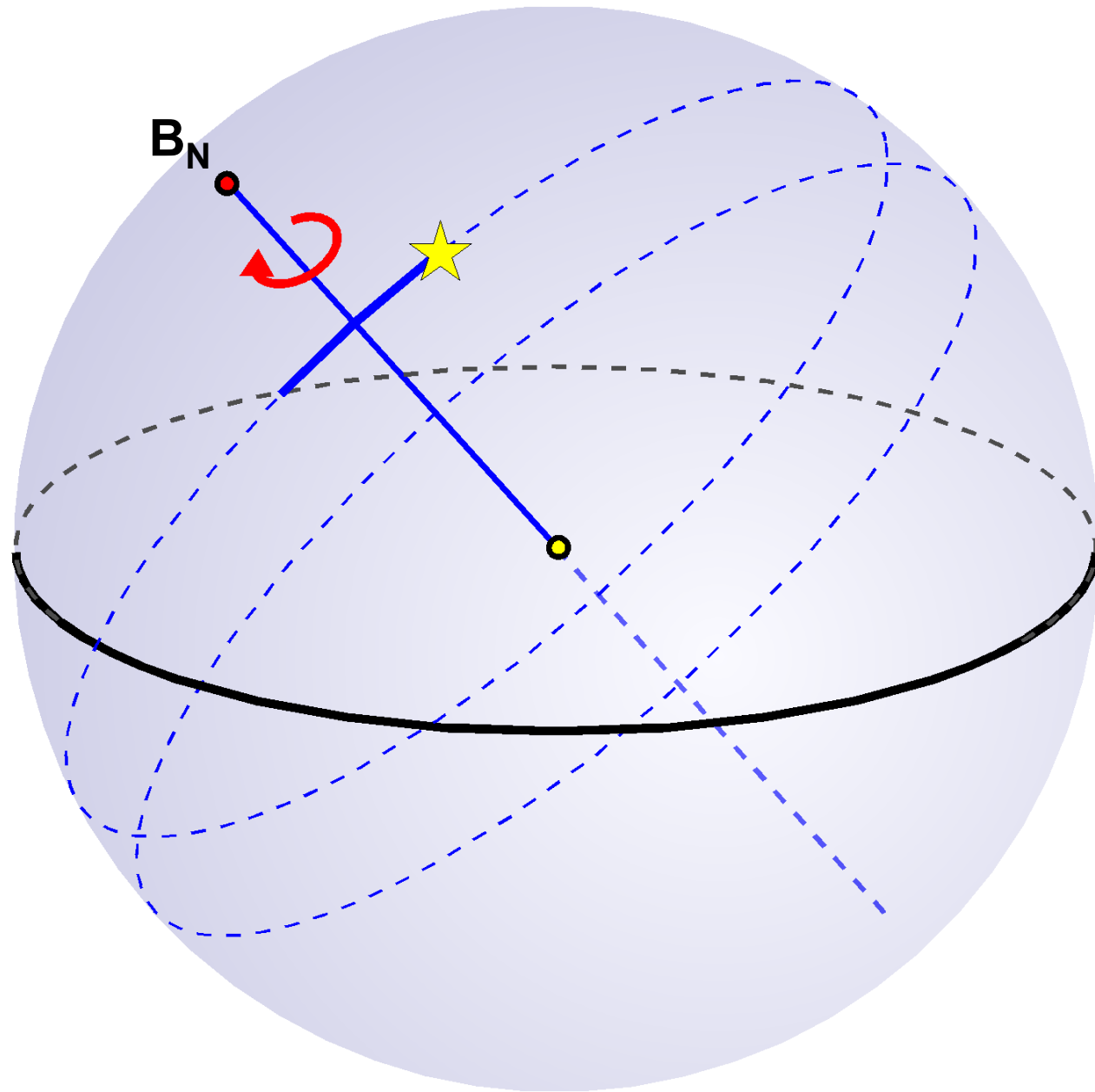


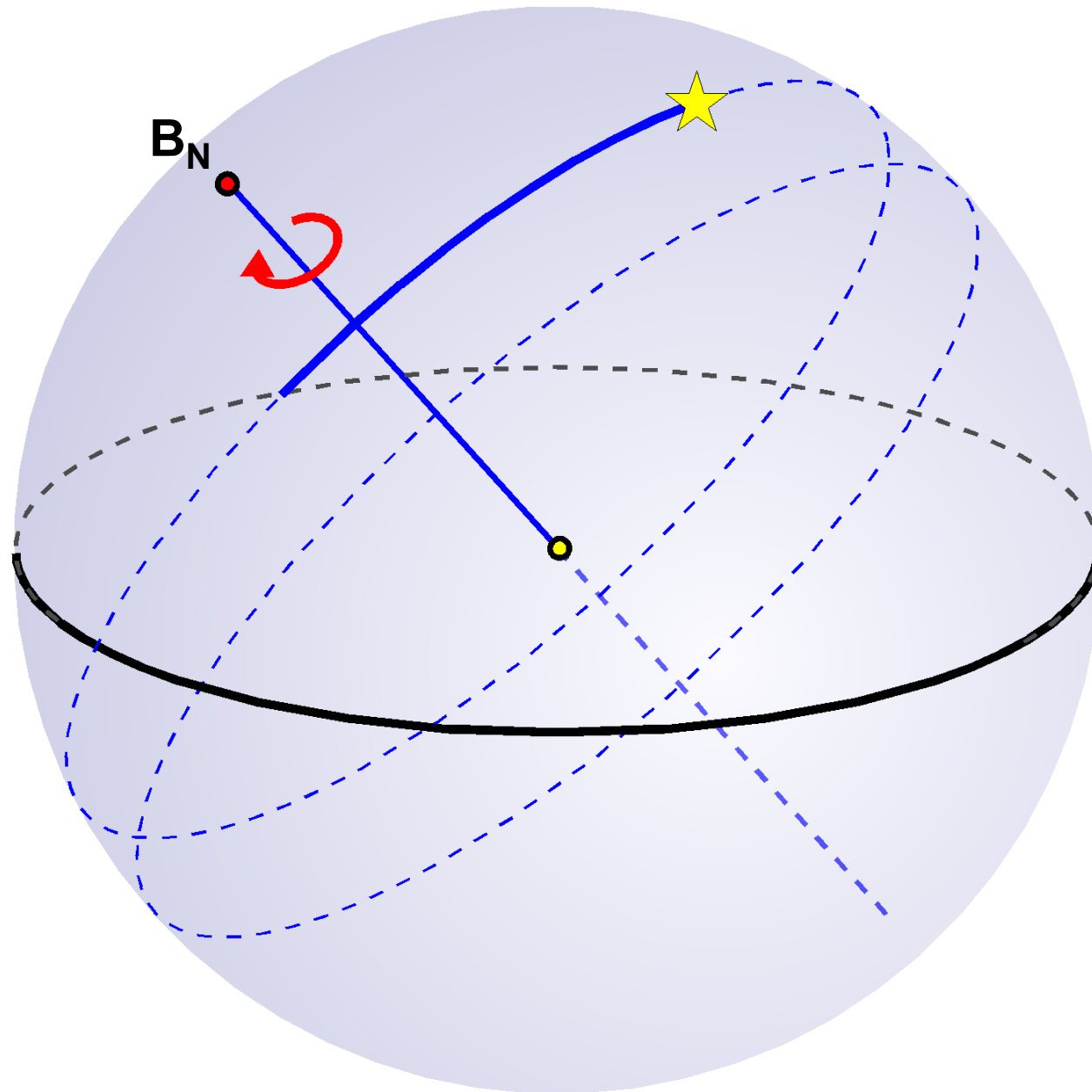


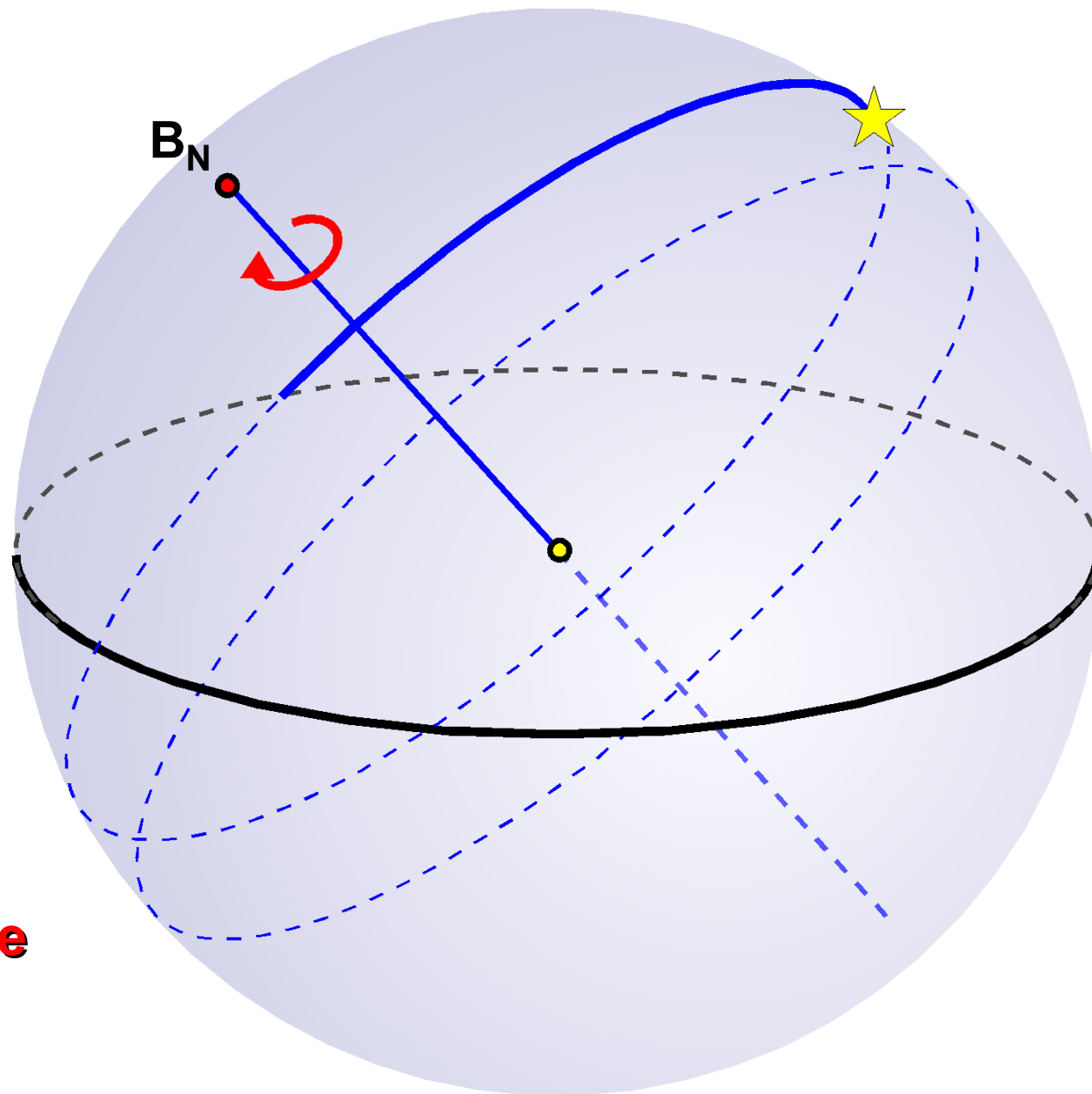
Zachód



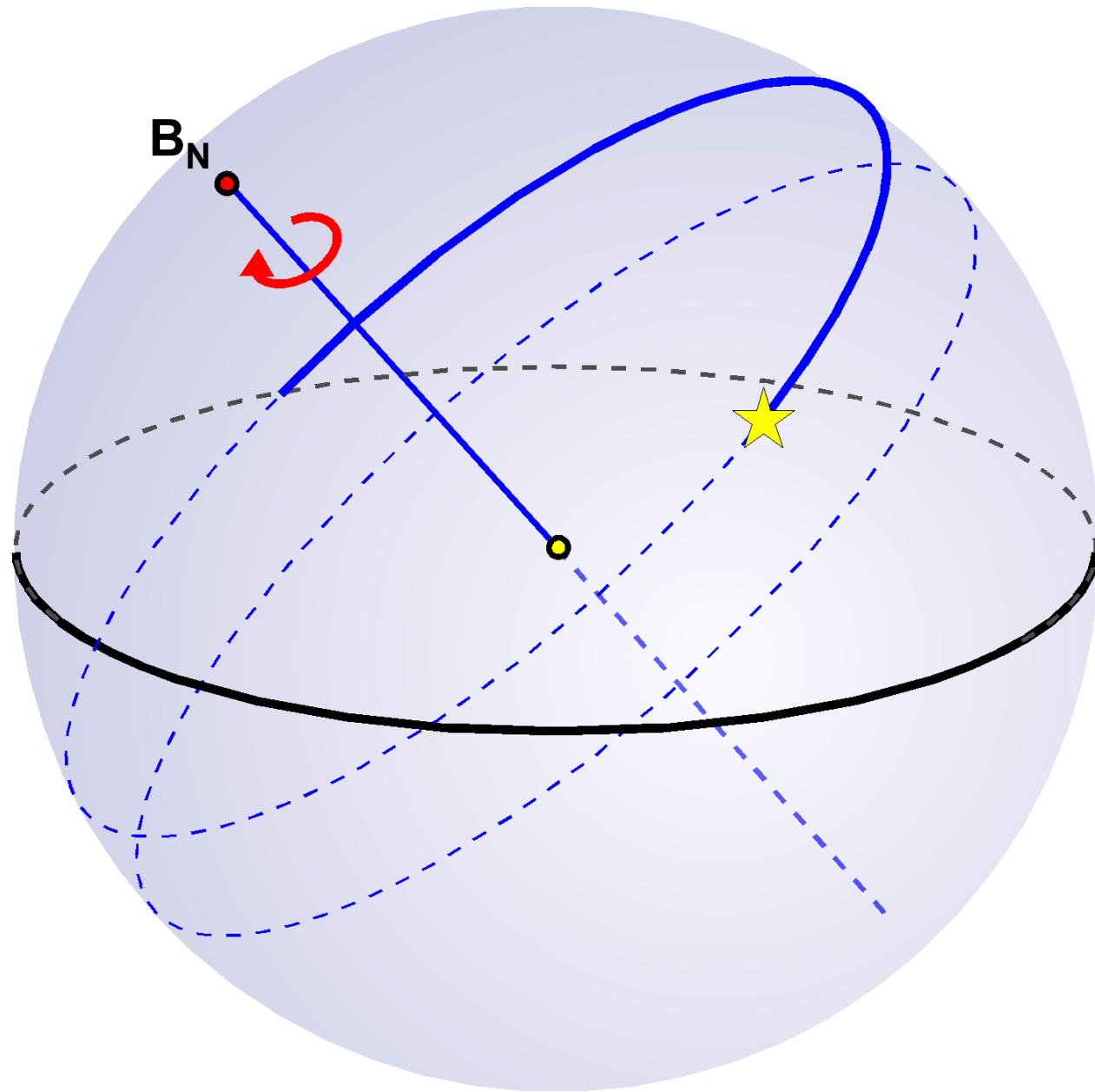
Wschód

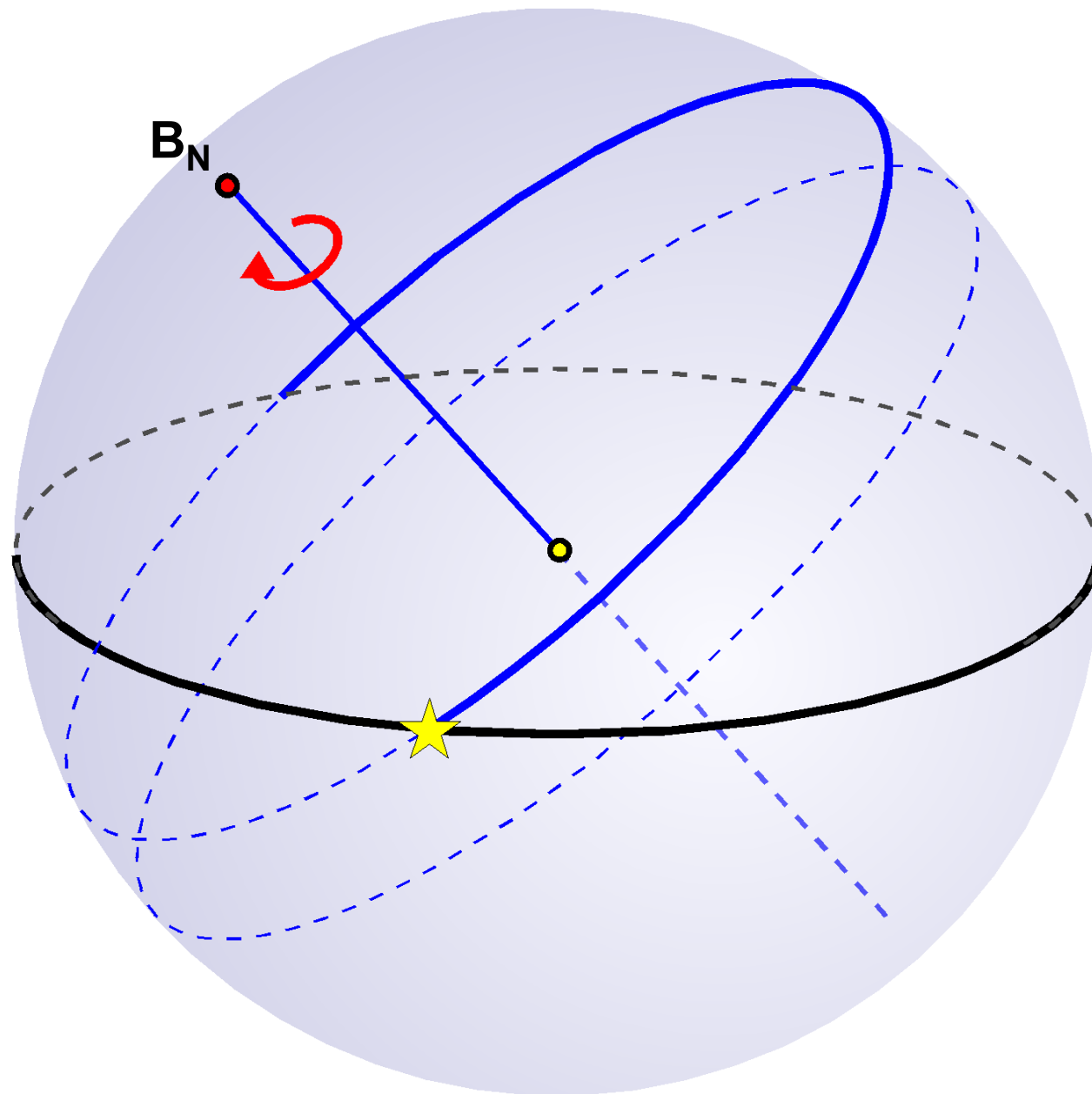




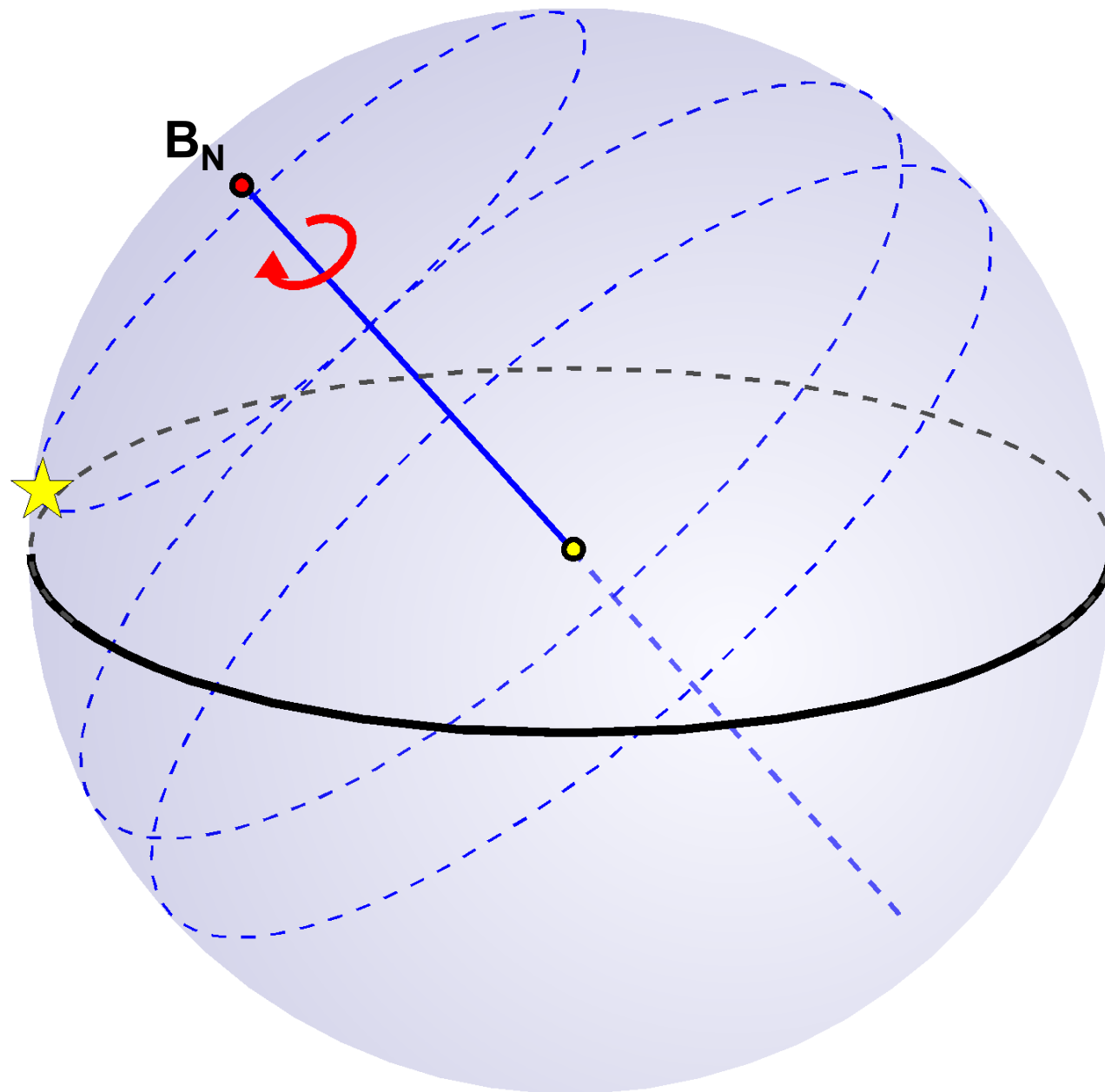


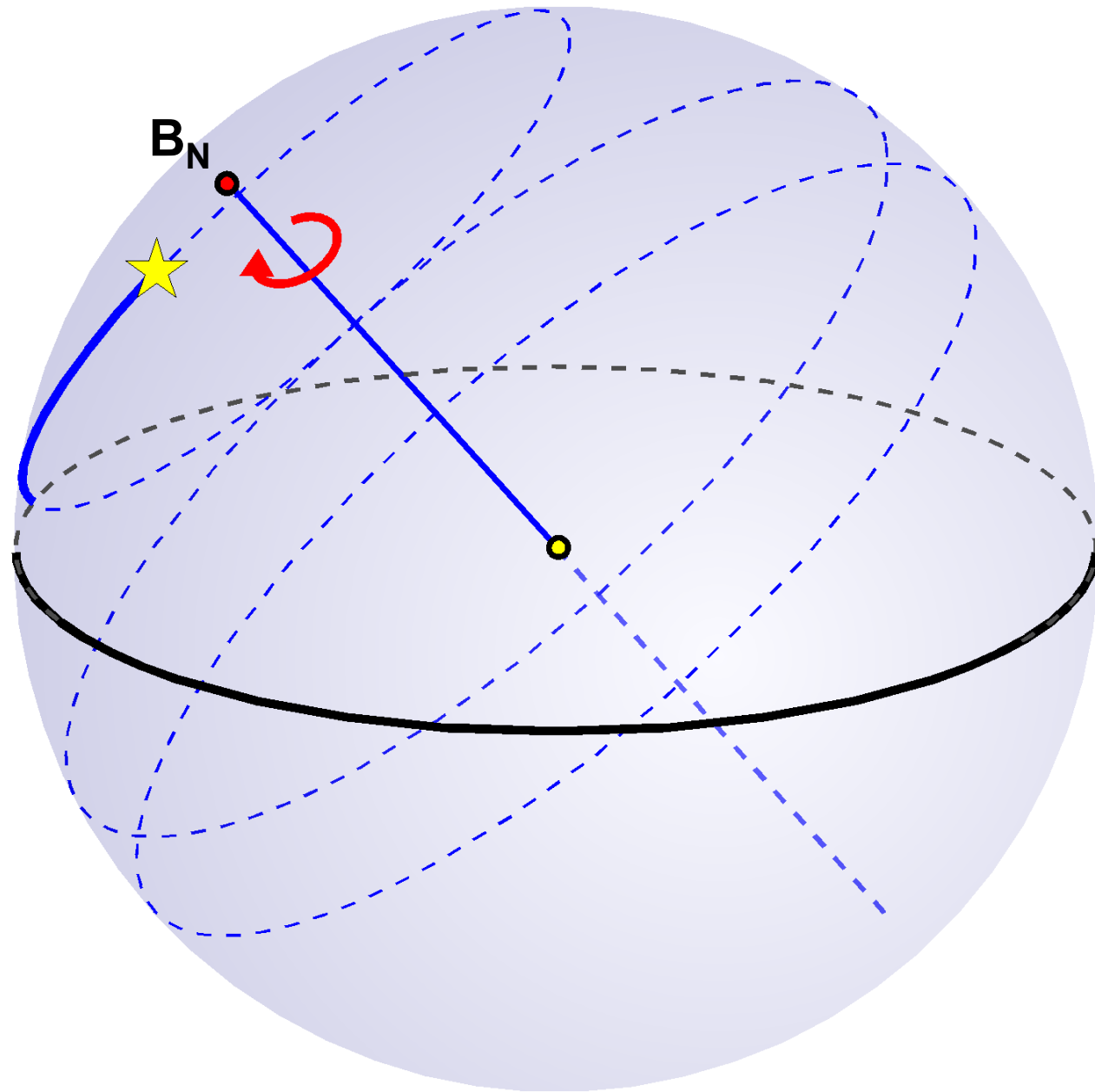
Górowanie

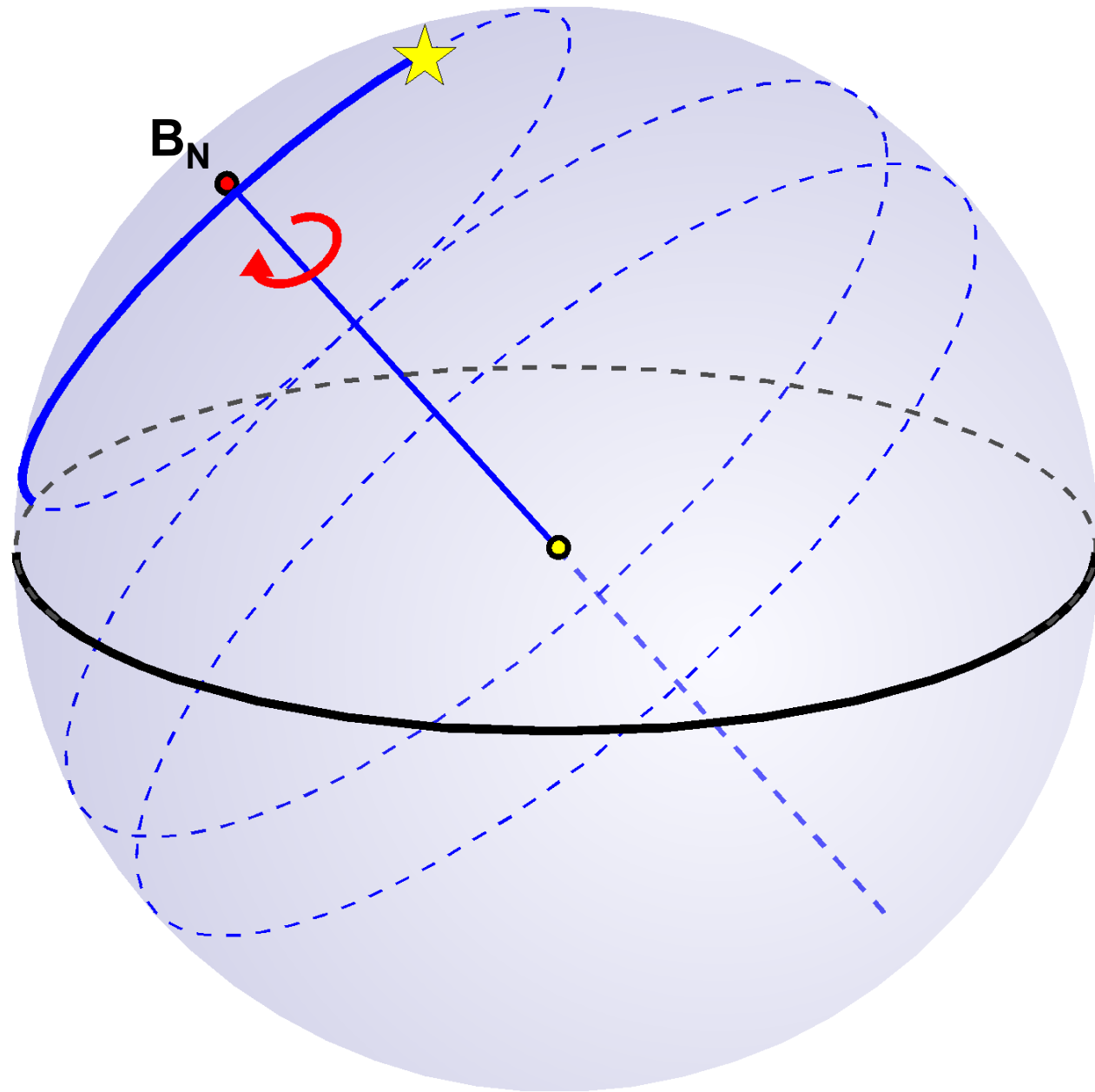


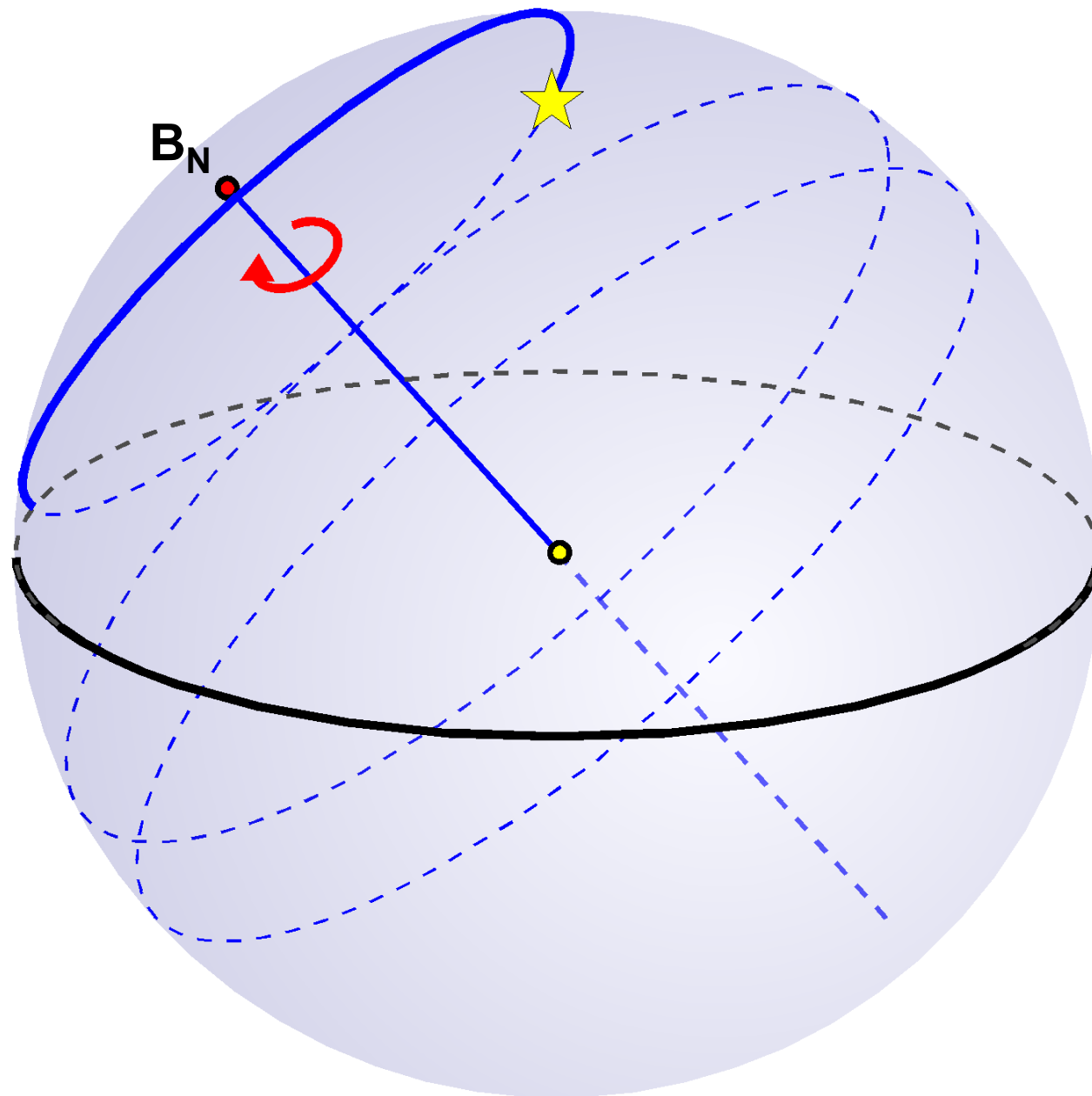


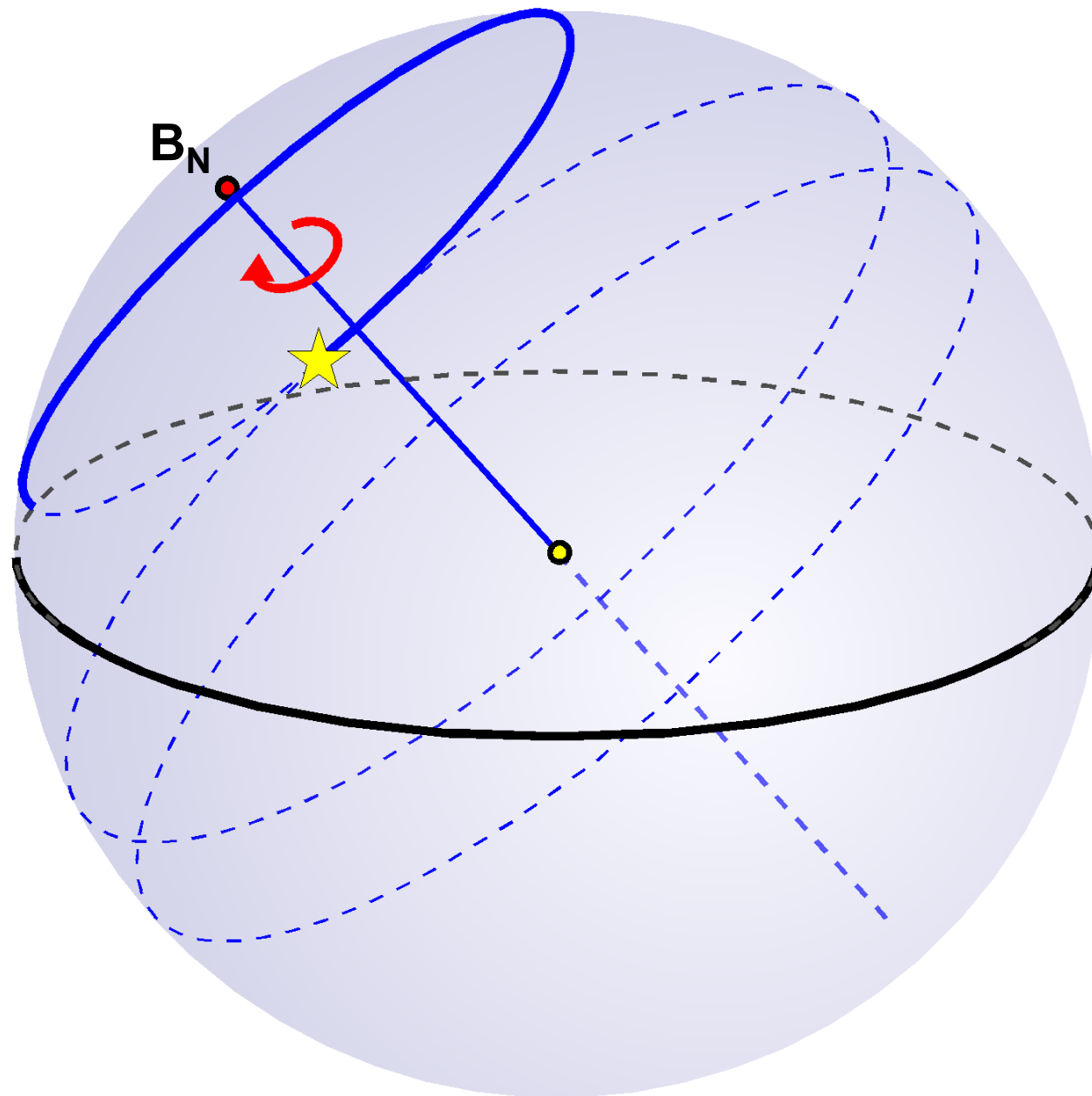
Zachód

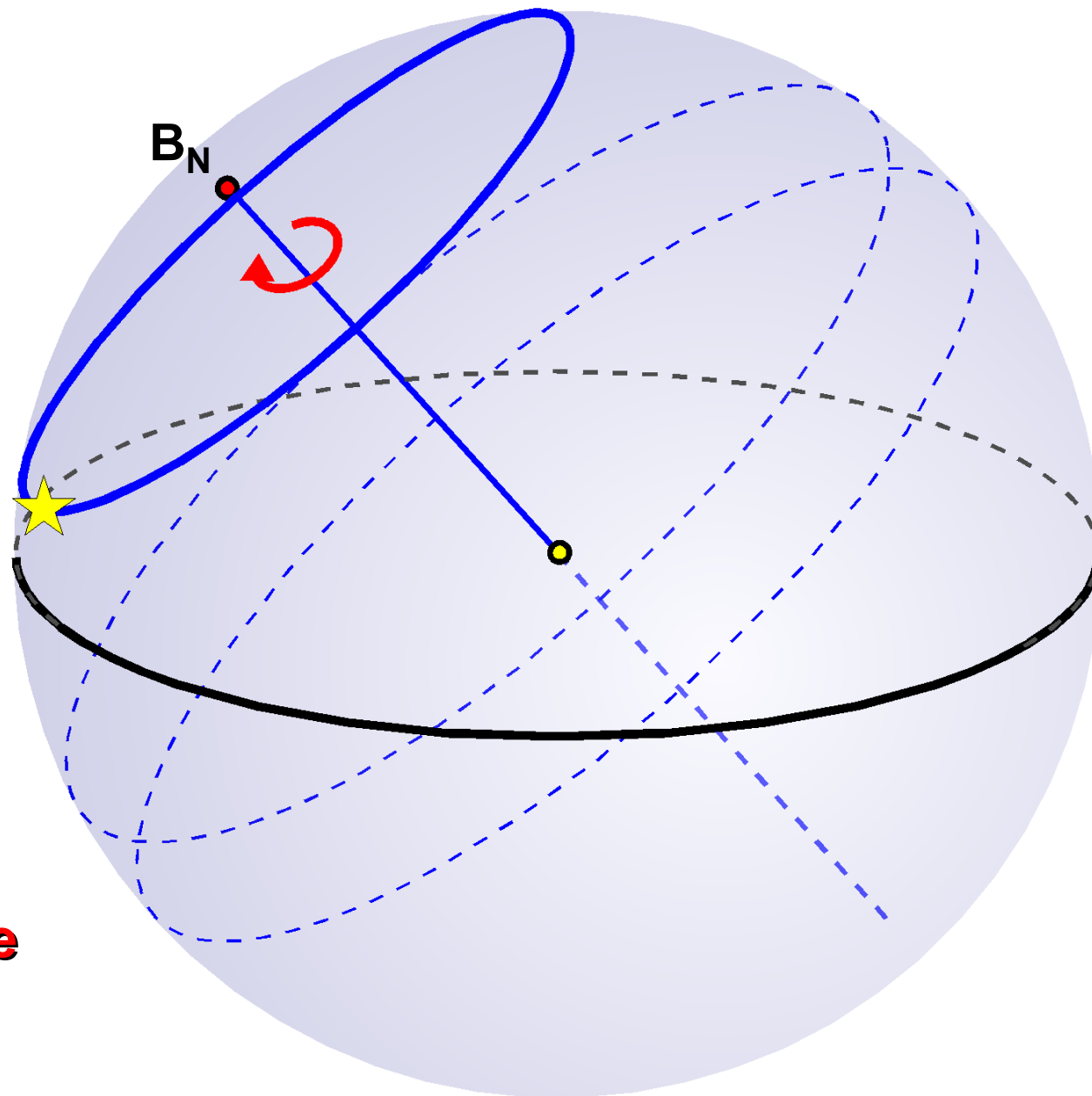




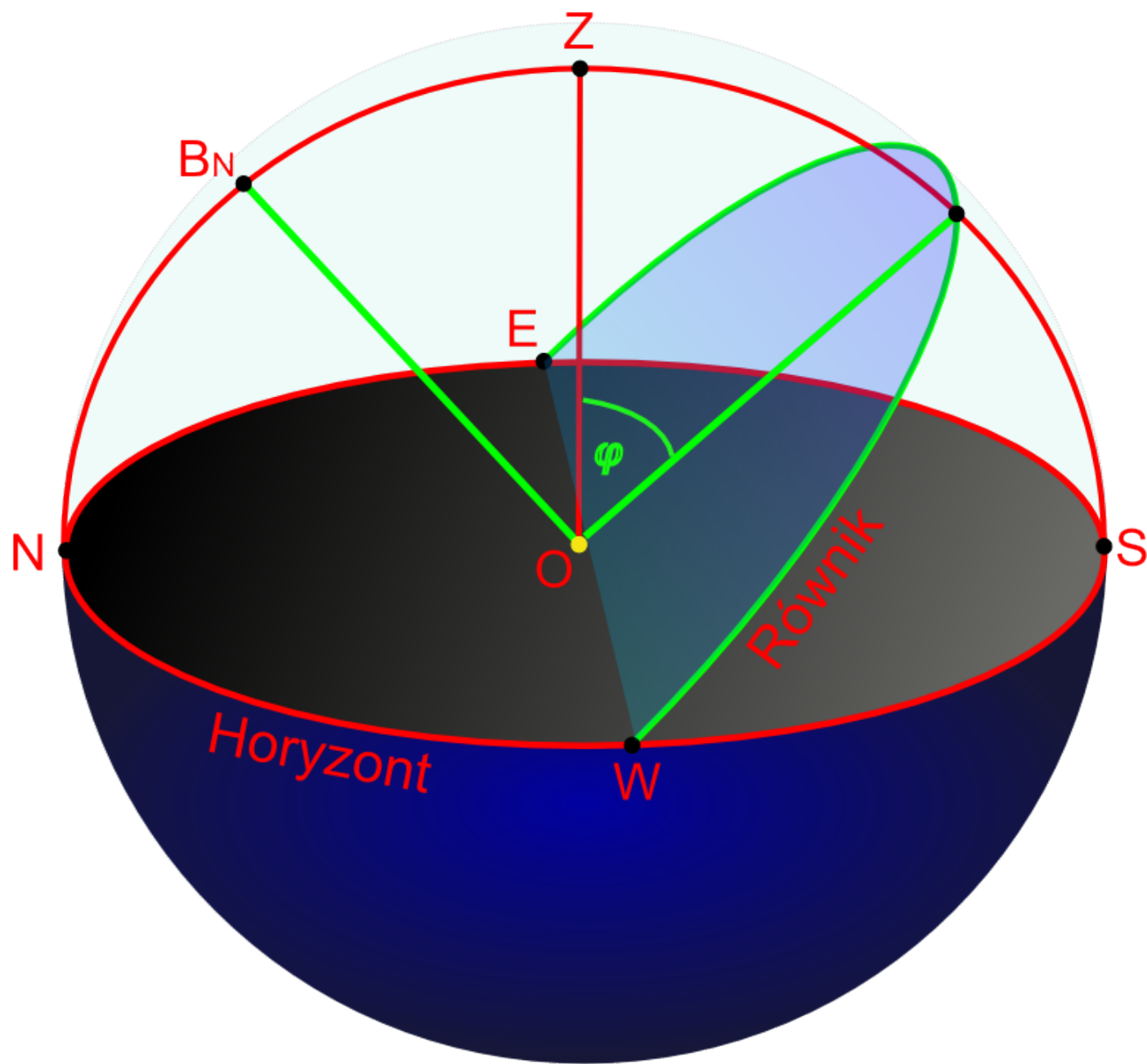


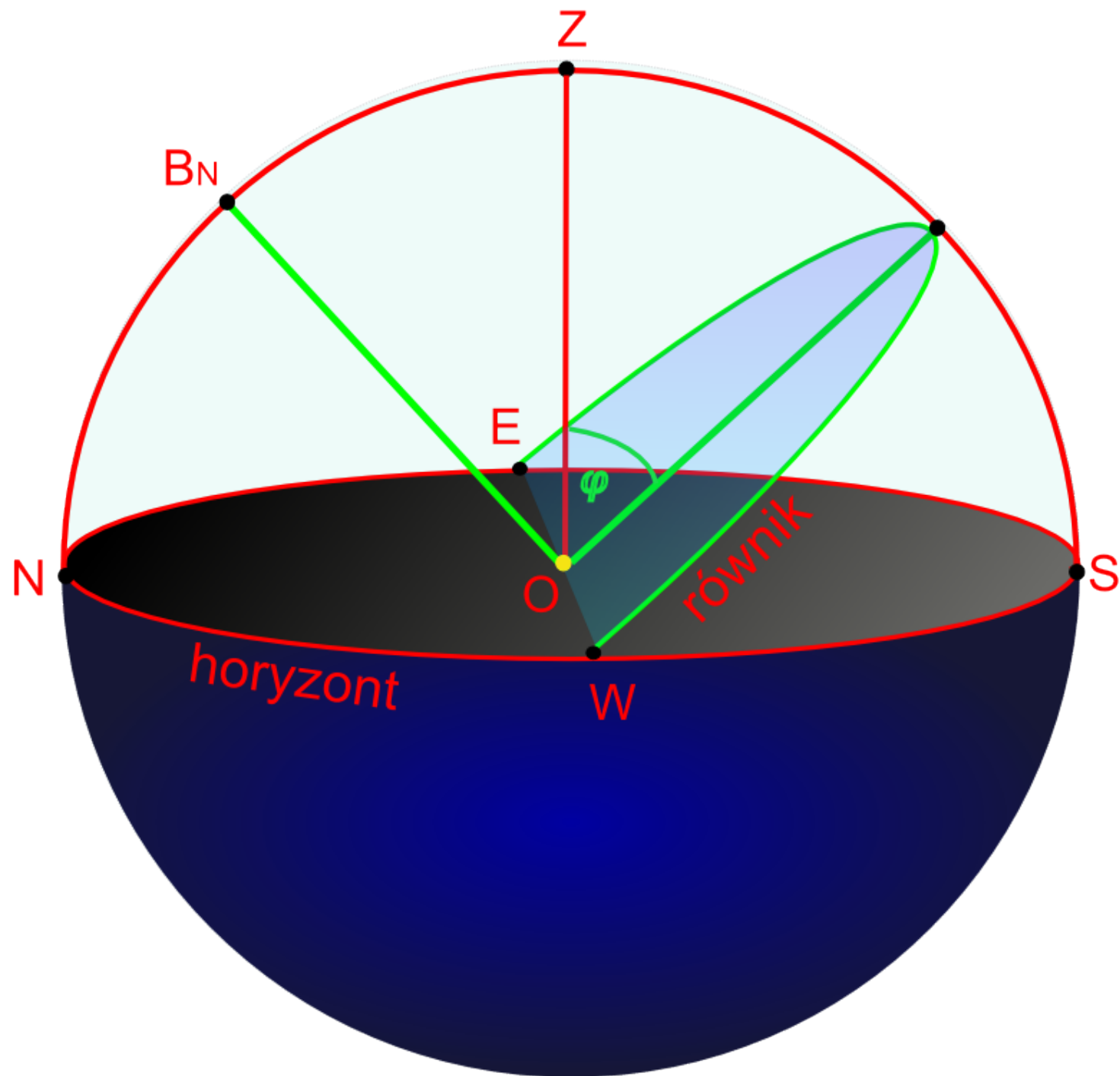


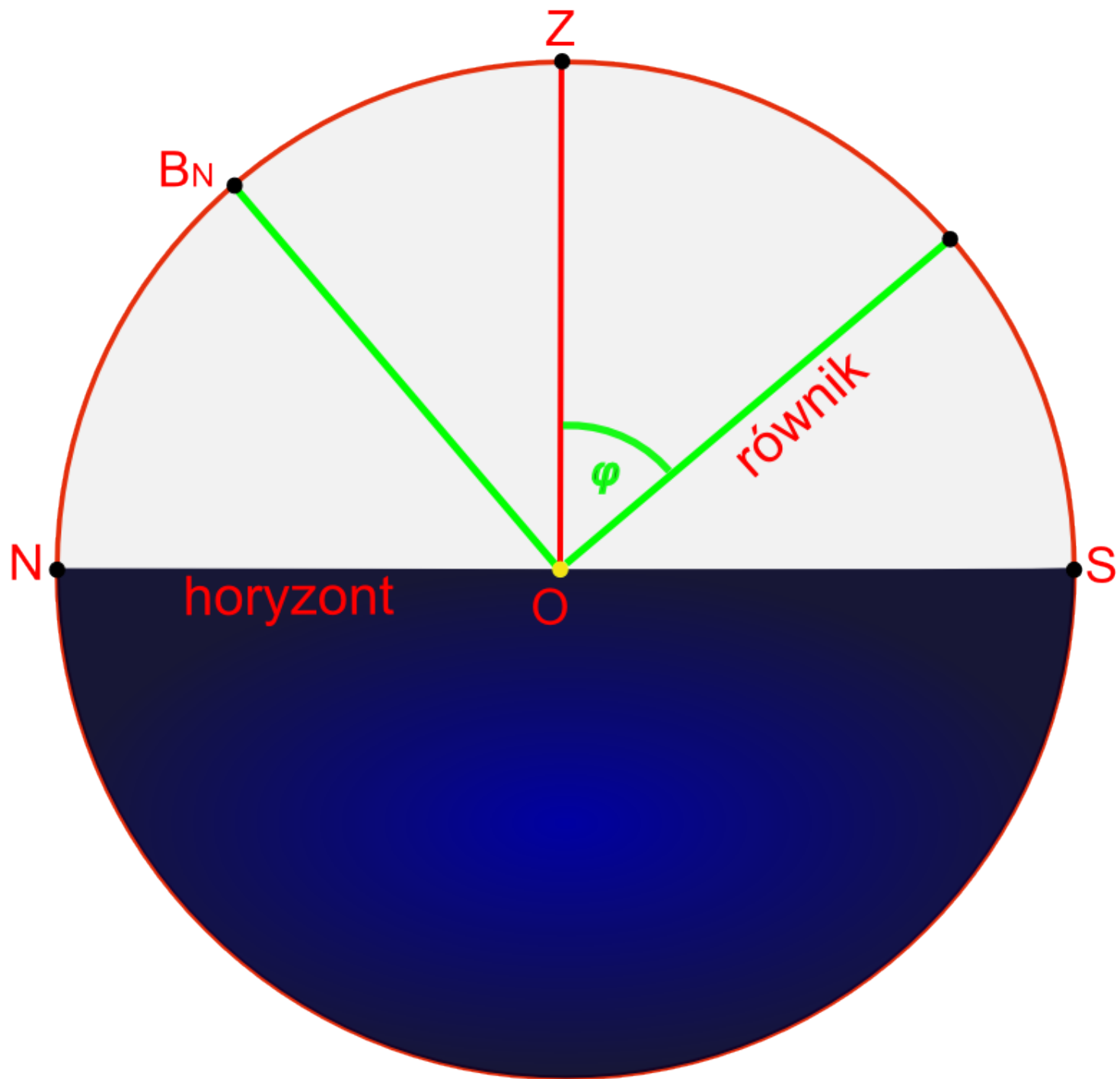


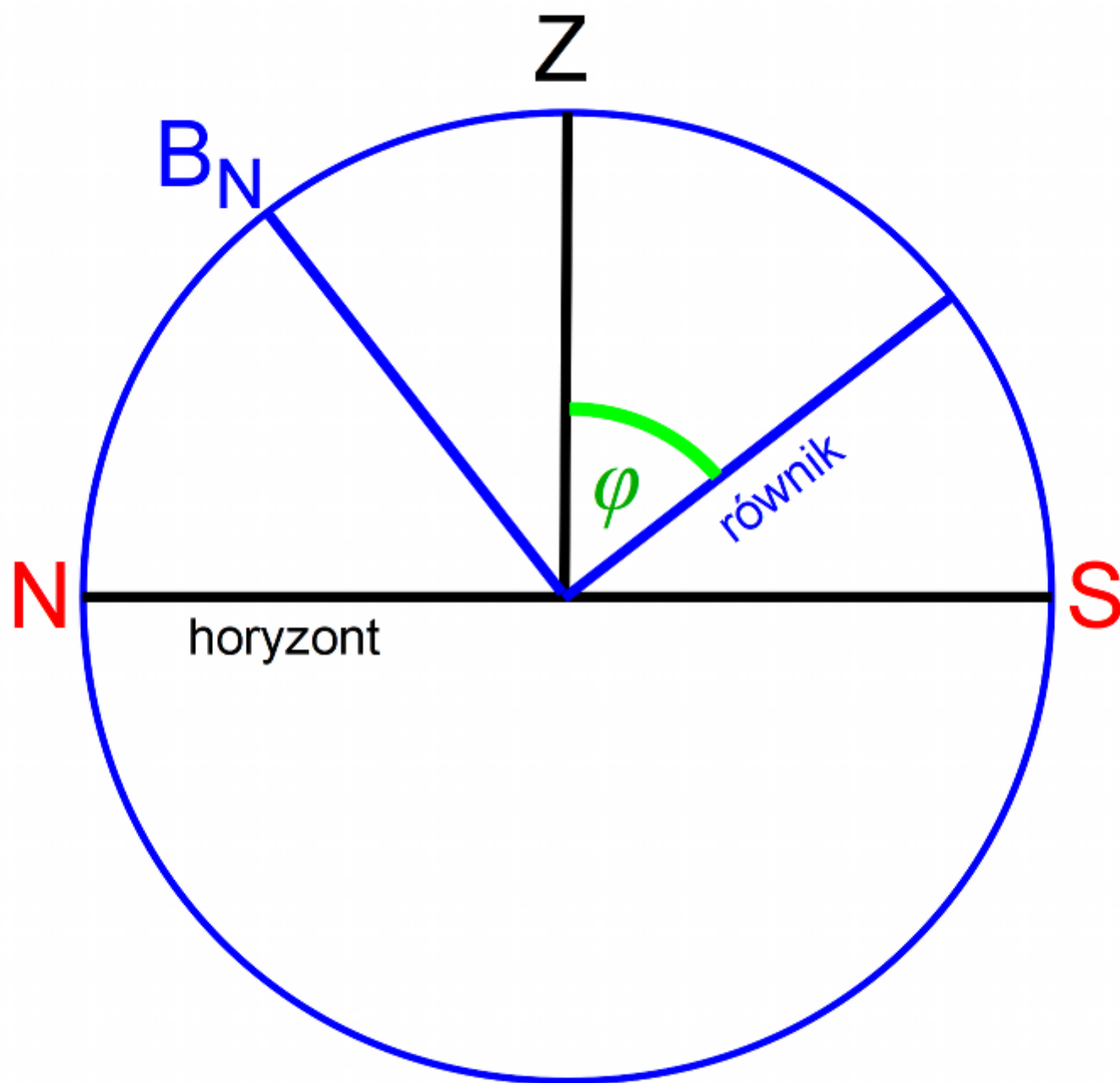


Dołowanie

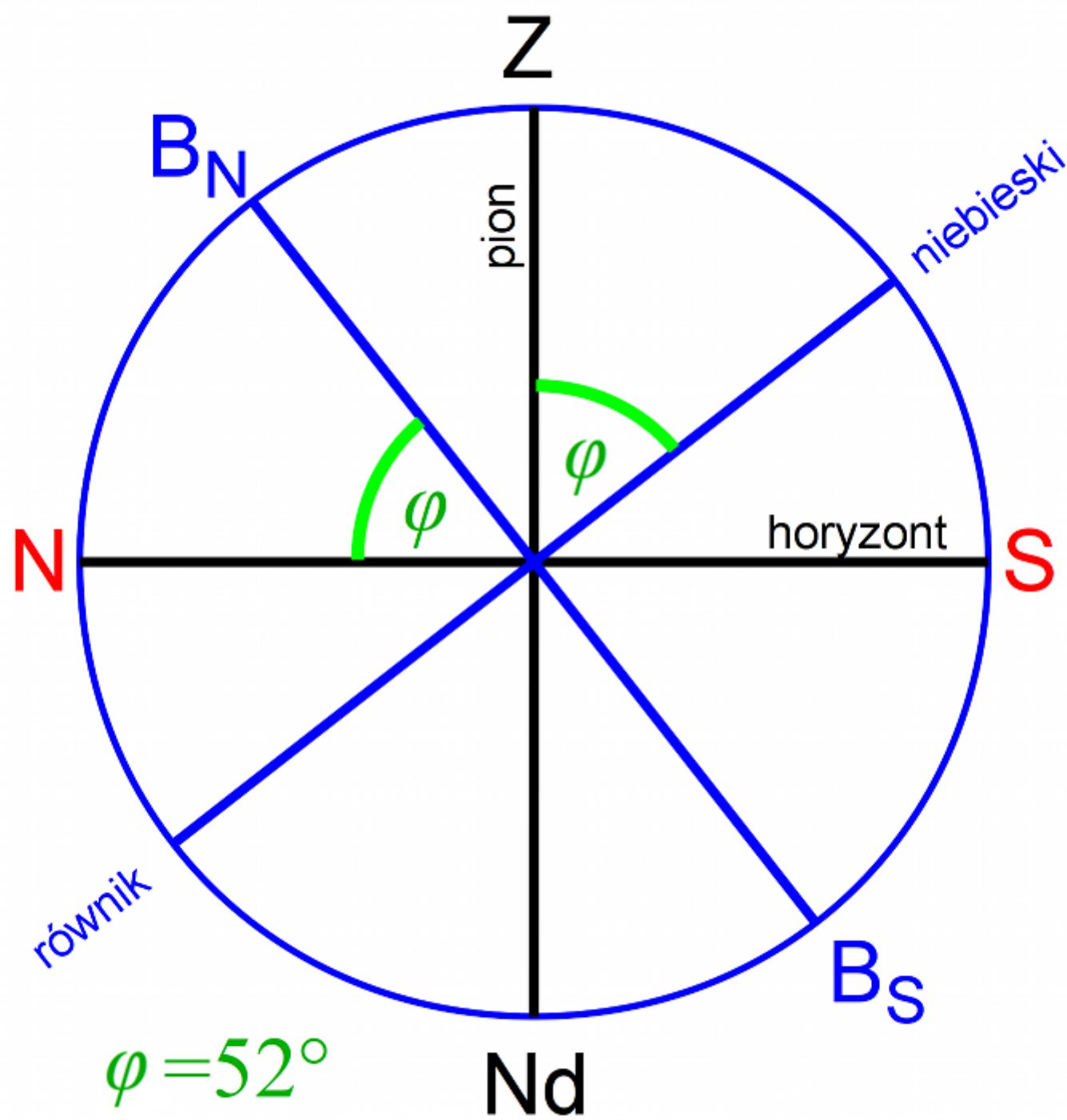


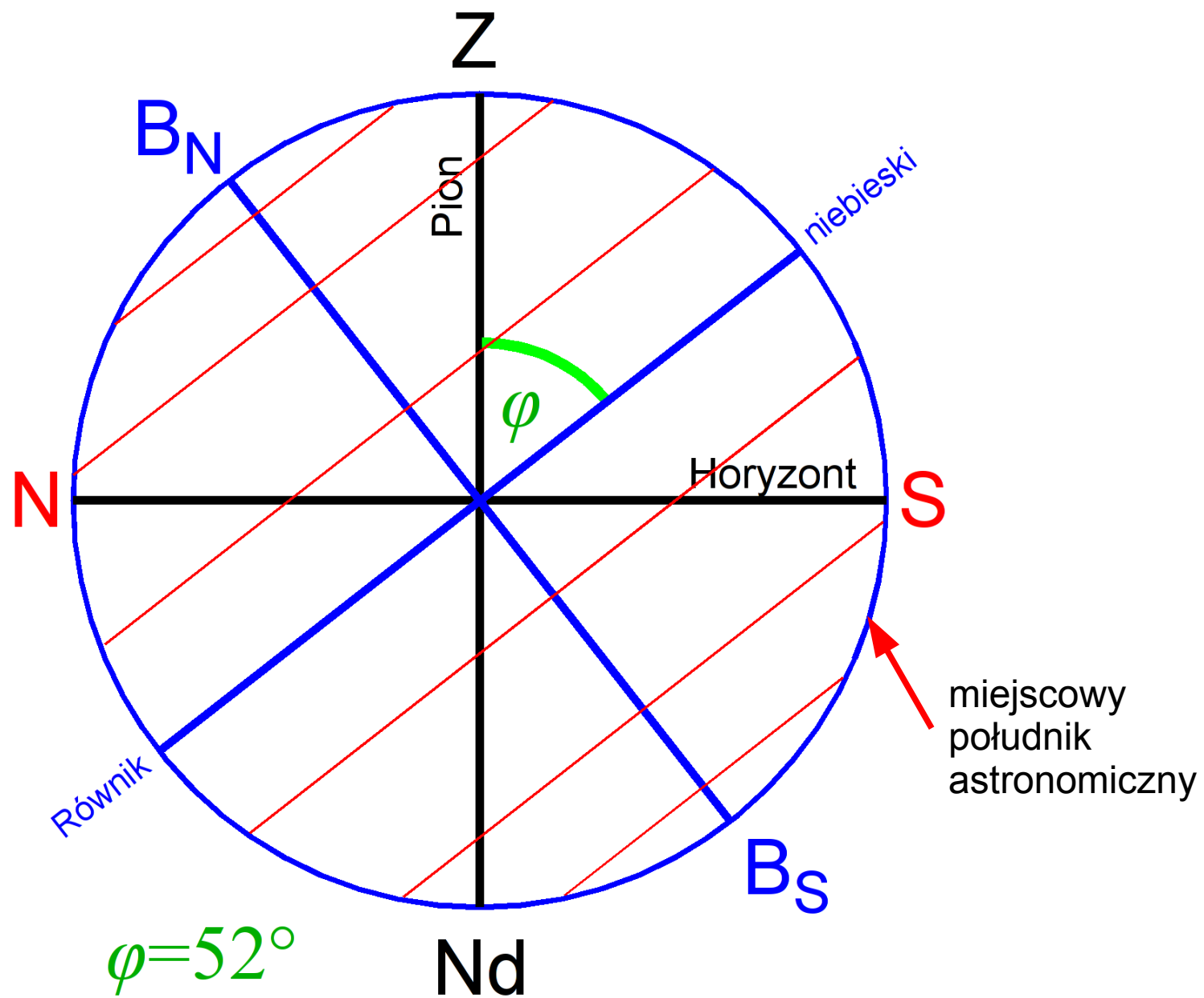


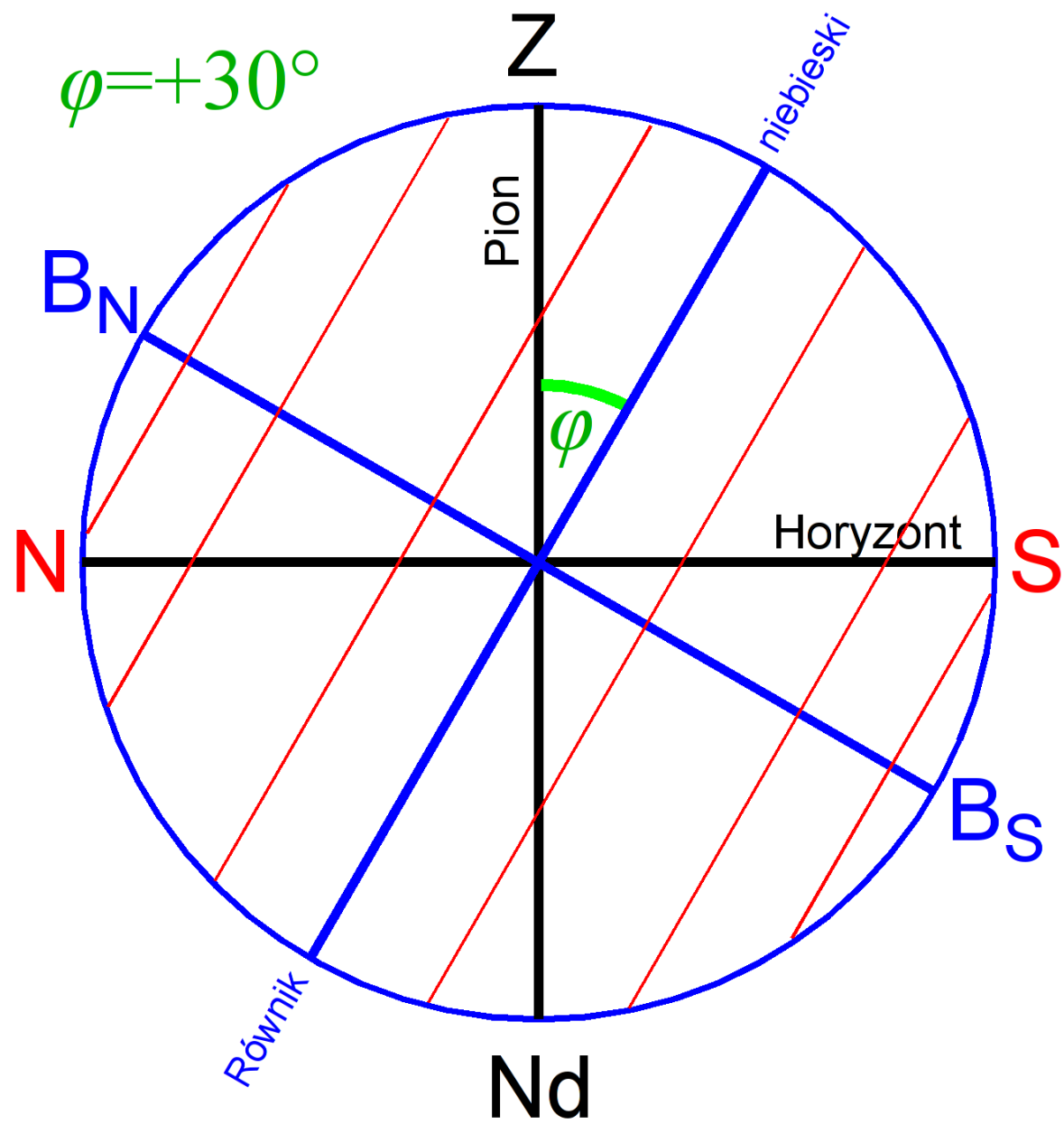


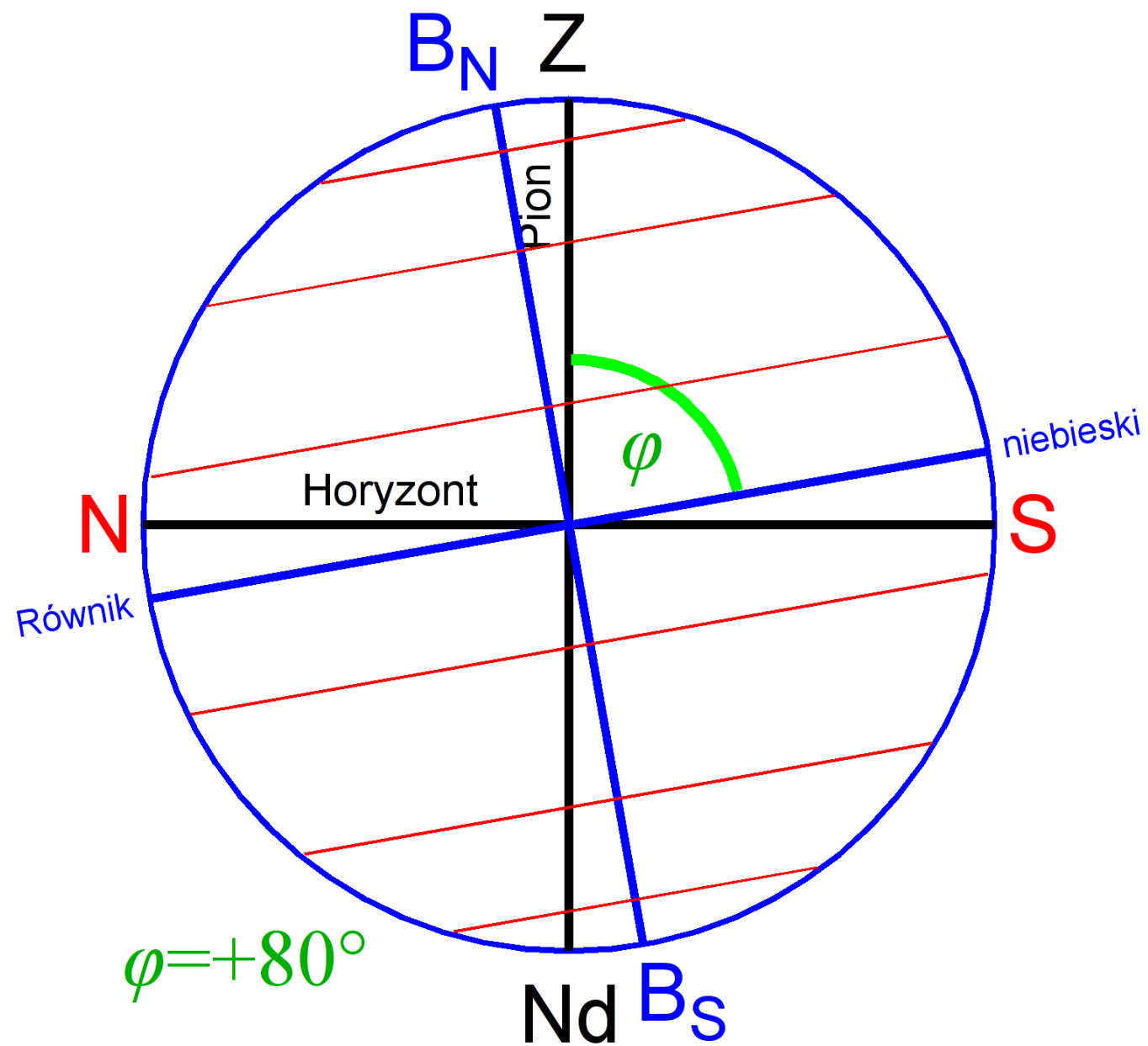


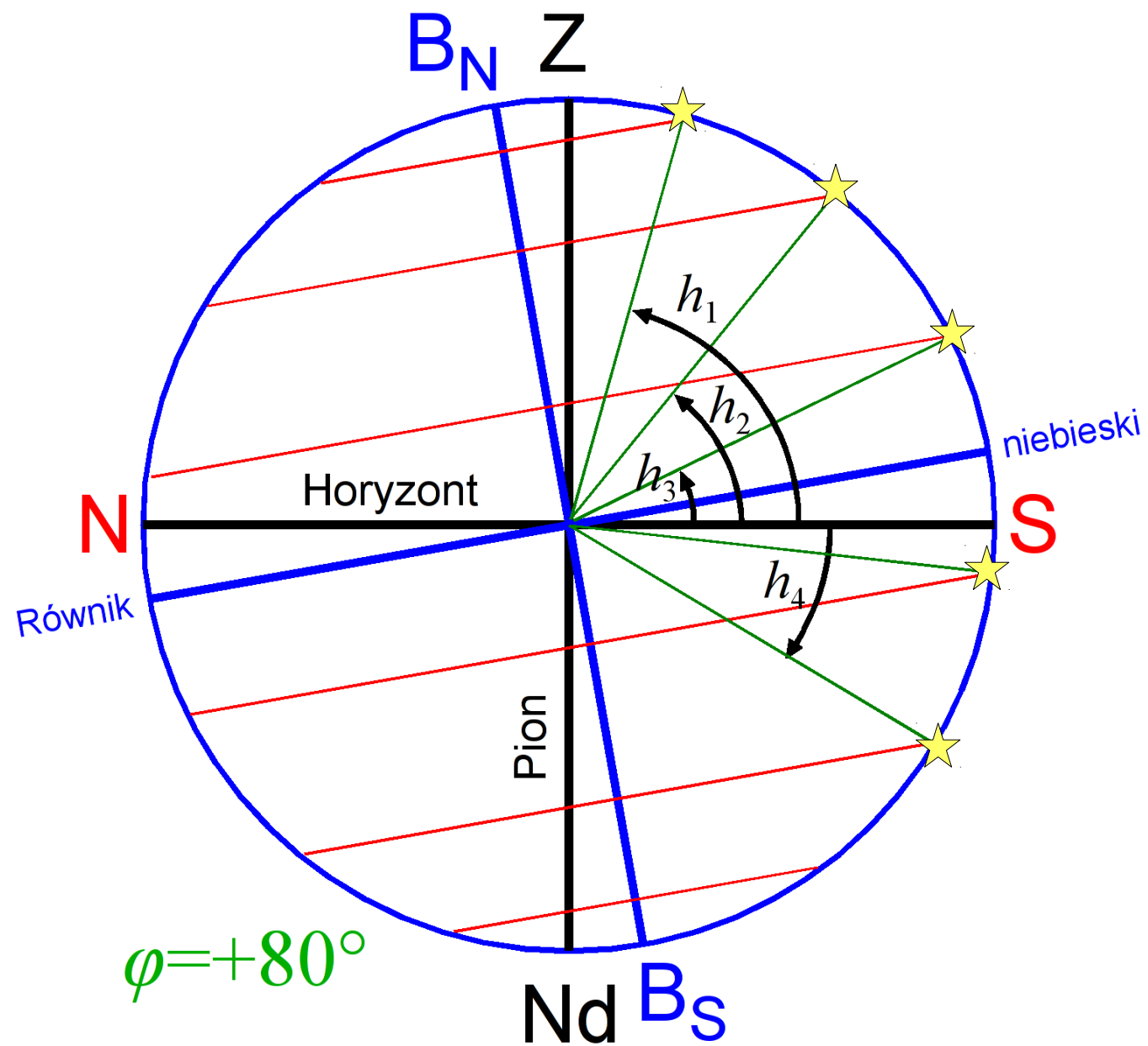
$$\varphi = 52^\circ$$



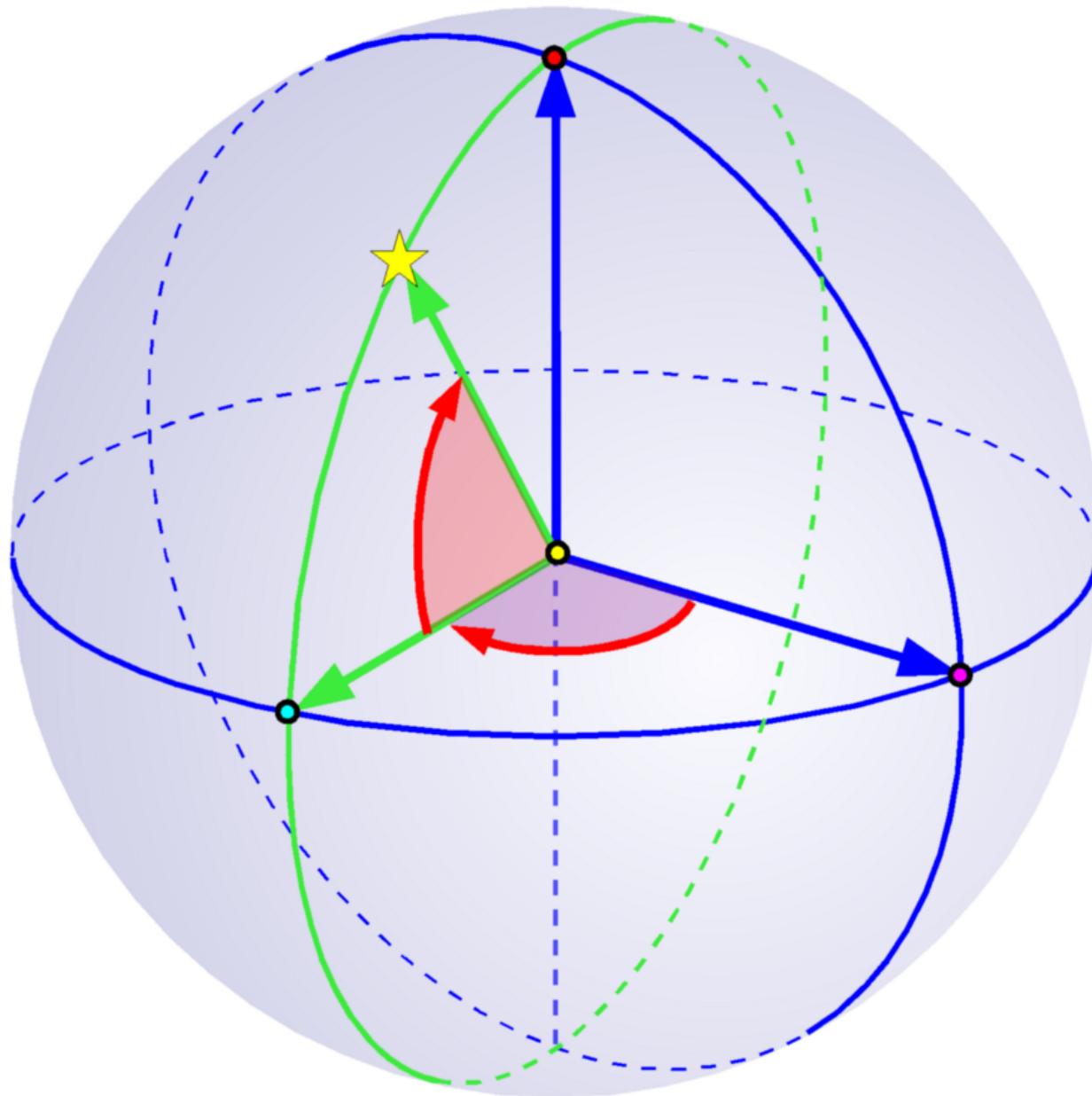




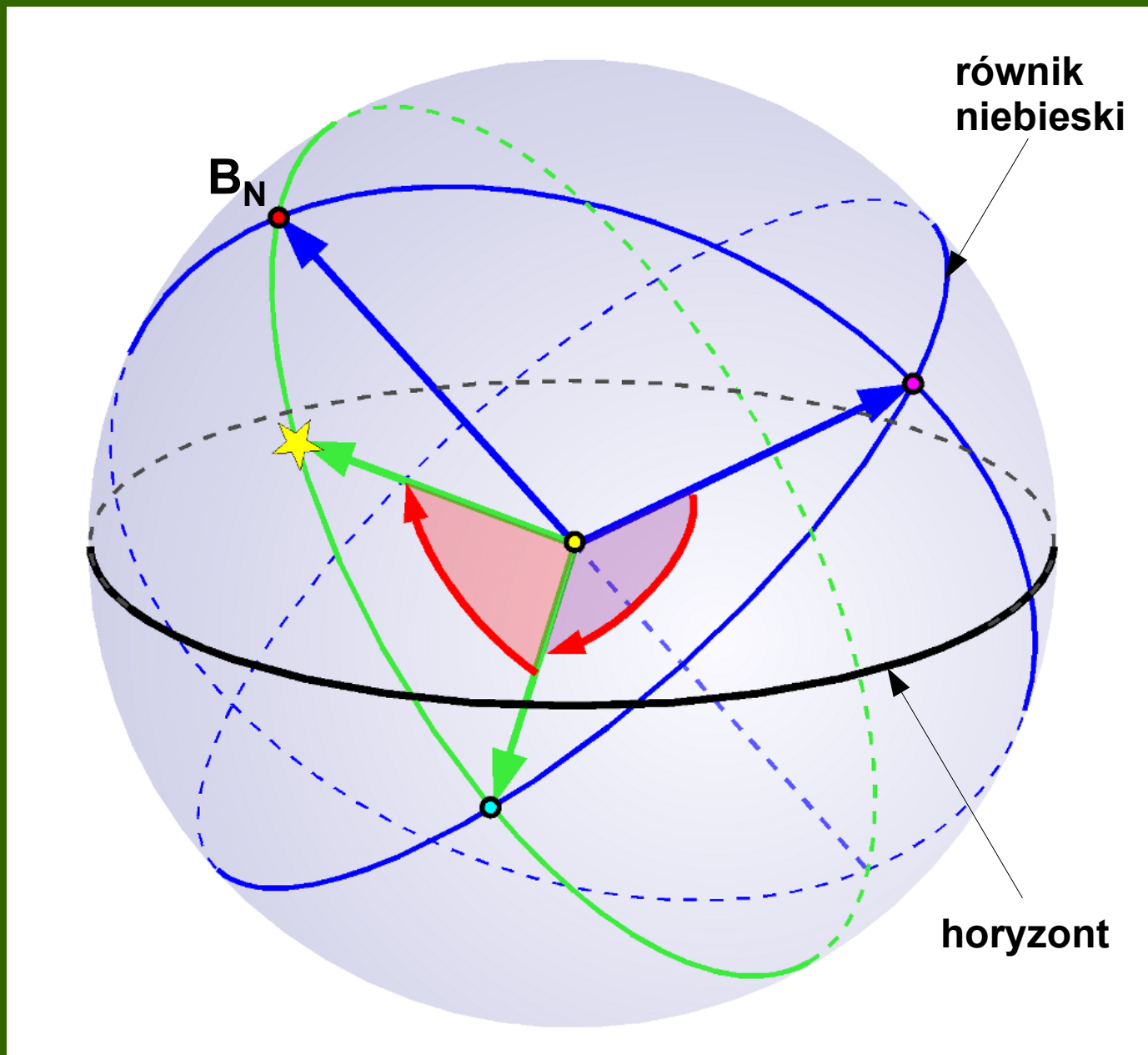




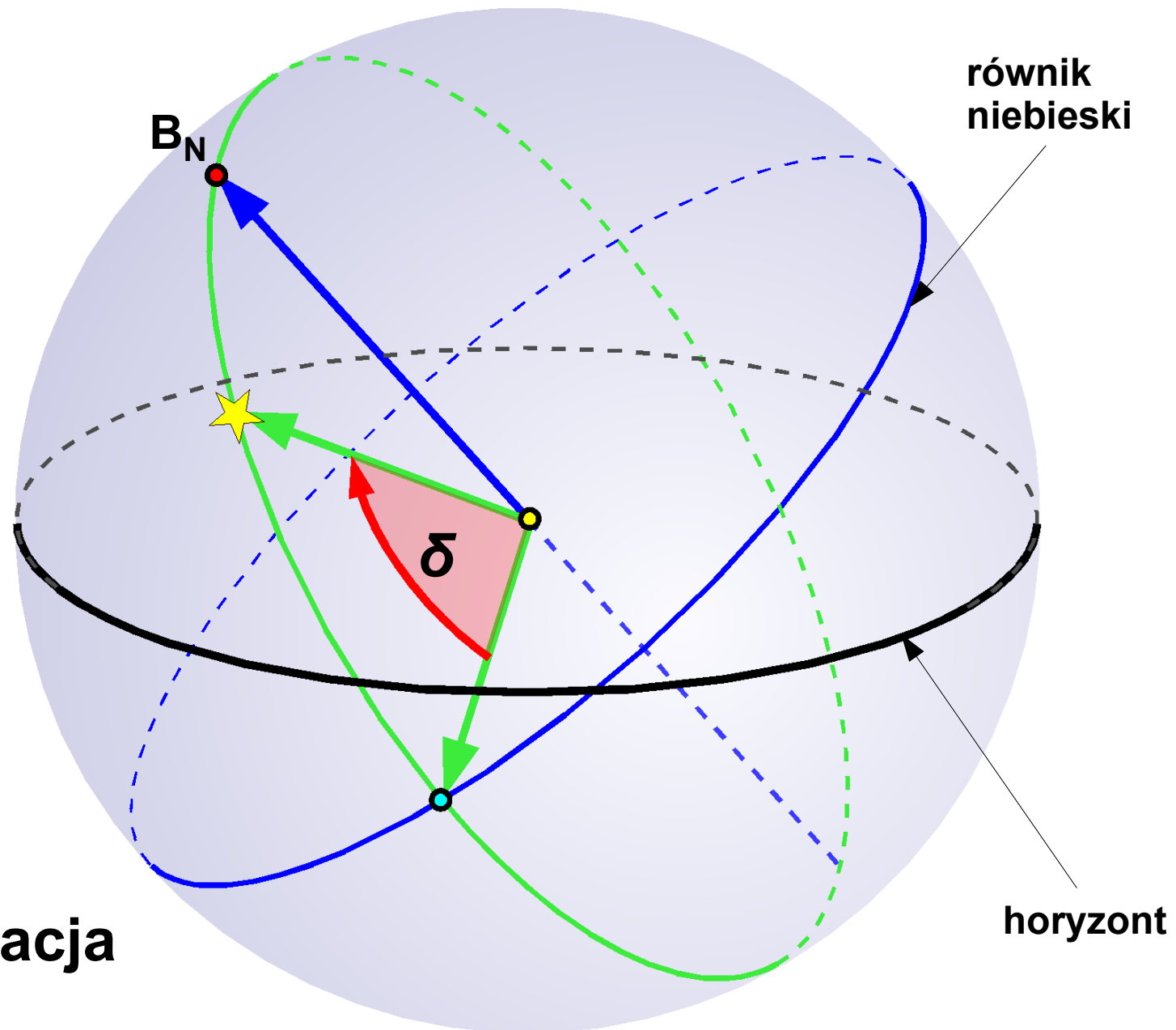
Współrzędne sferyczne



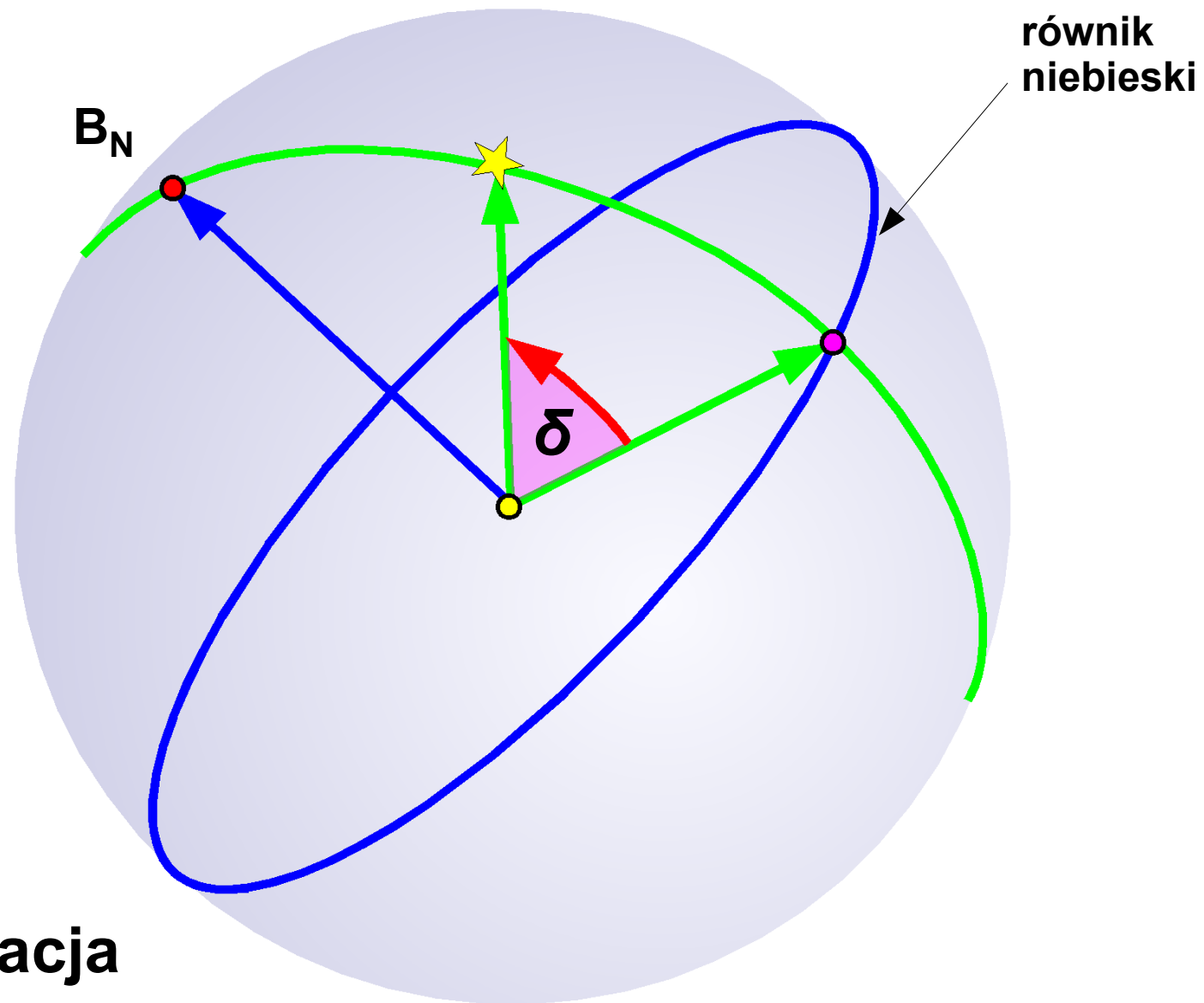
Współrzędne sferyczne



deklinacja



deklinacja



północny
biegun świata

B_N

deklinacja

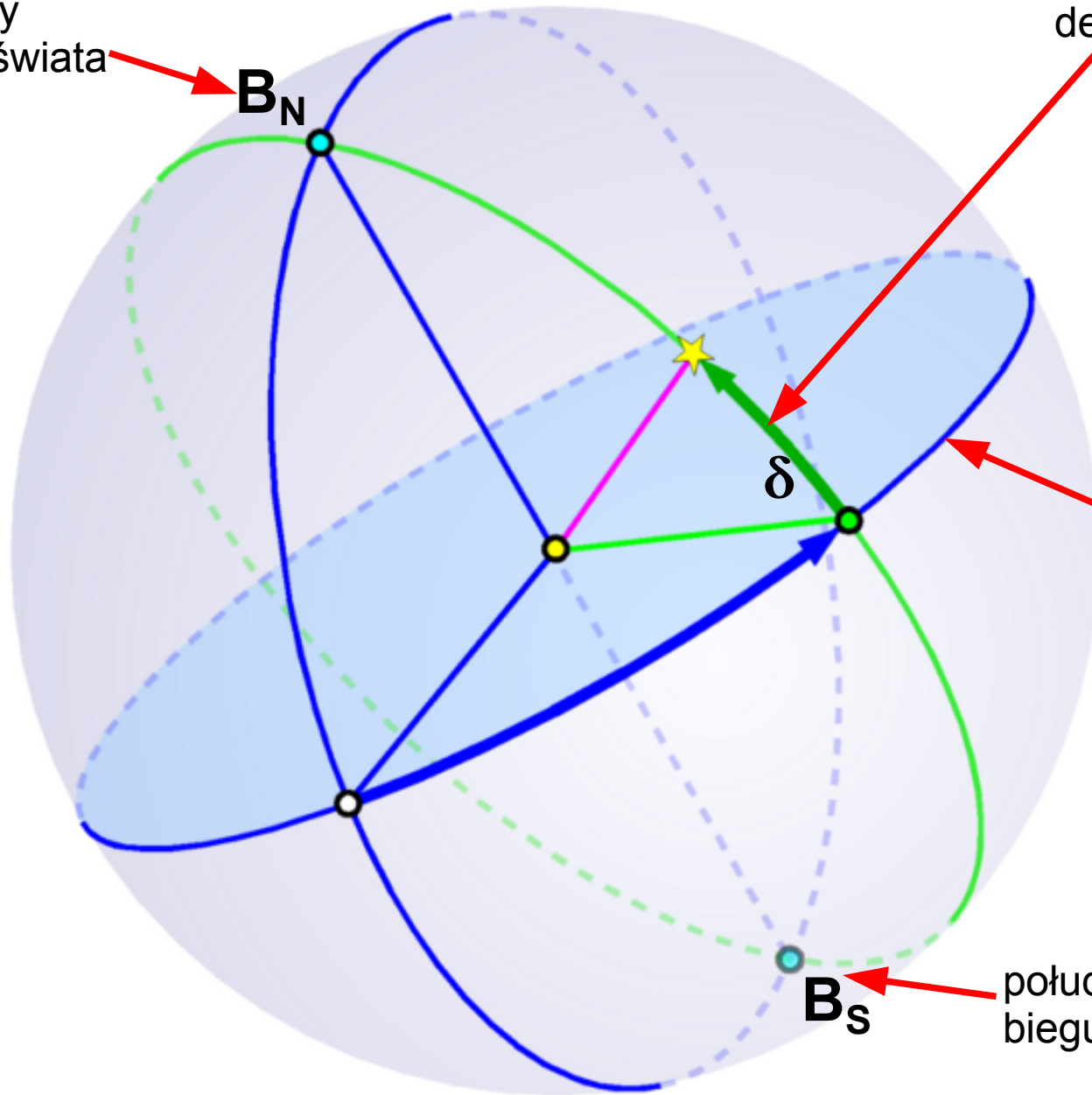
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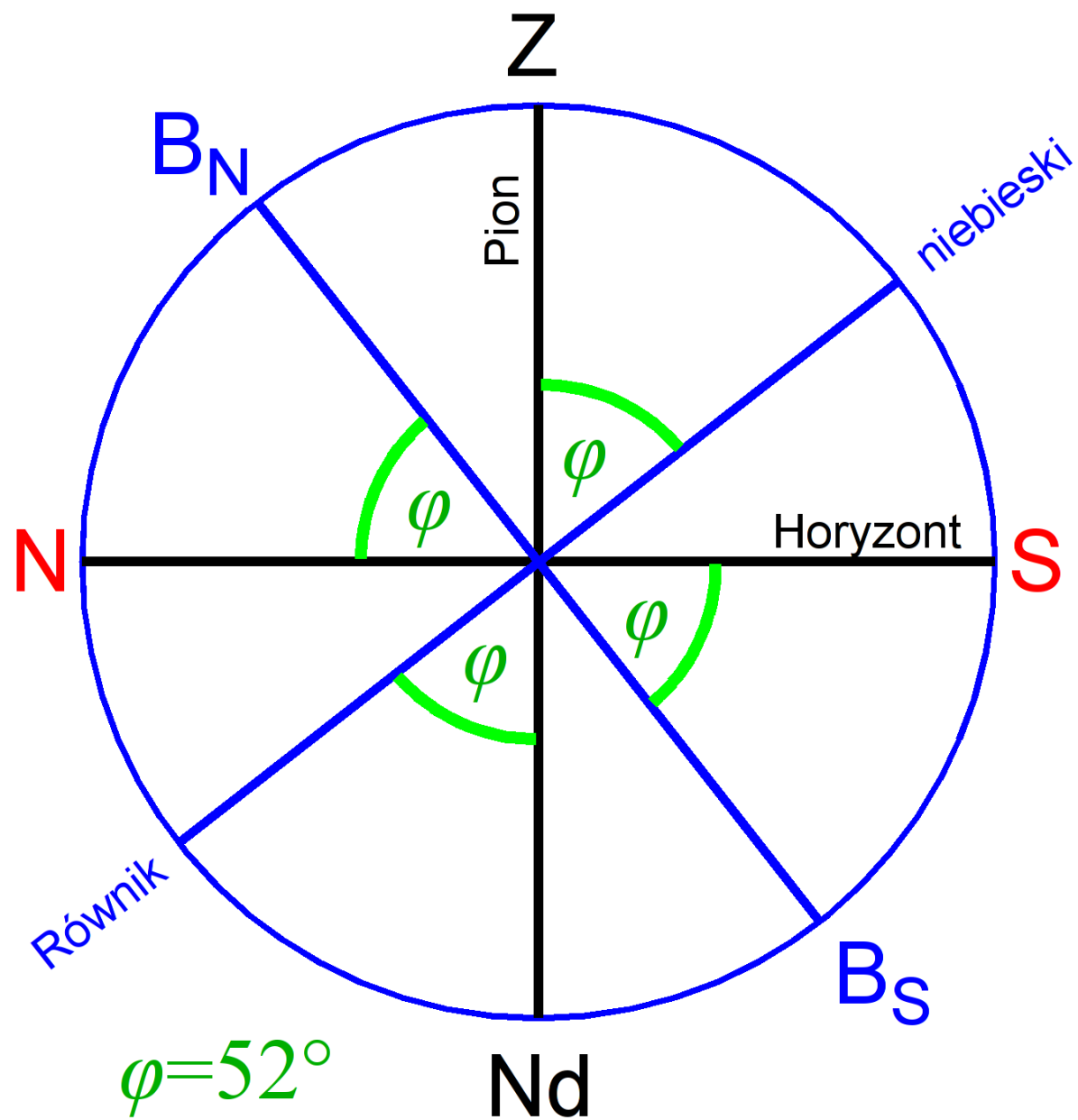
równik niebieski

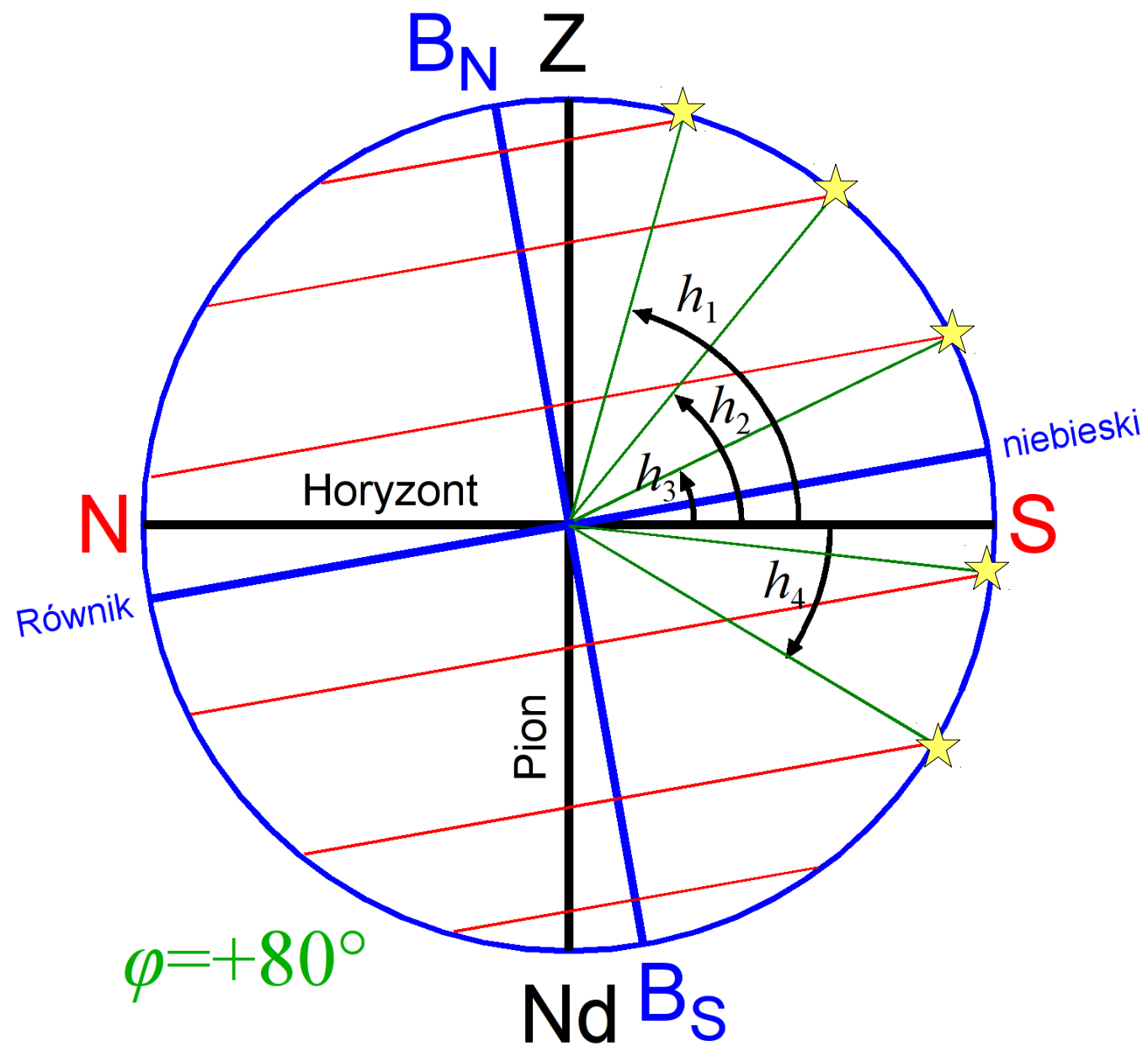
B_S

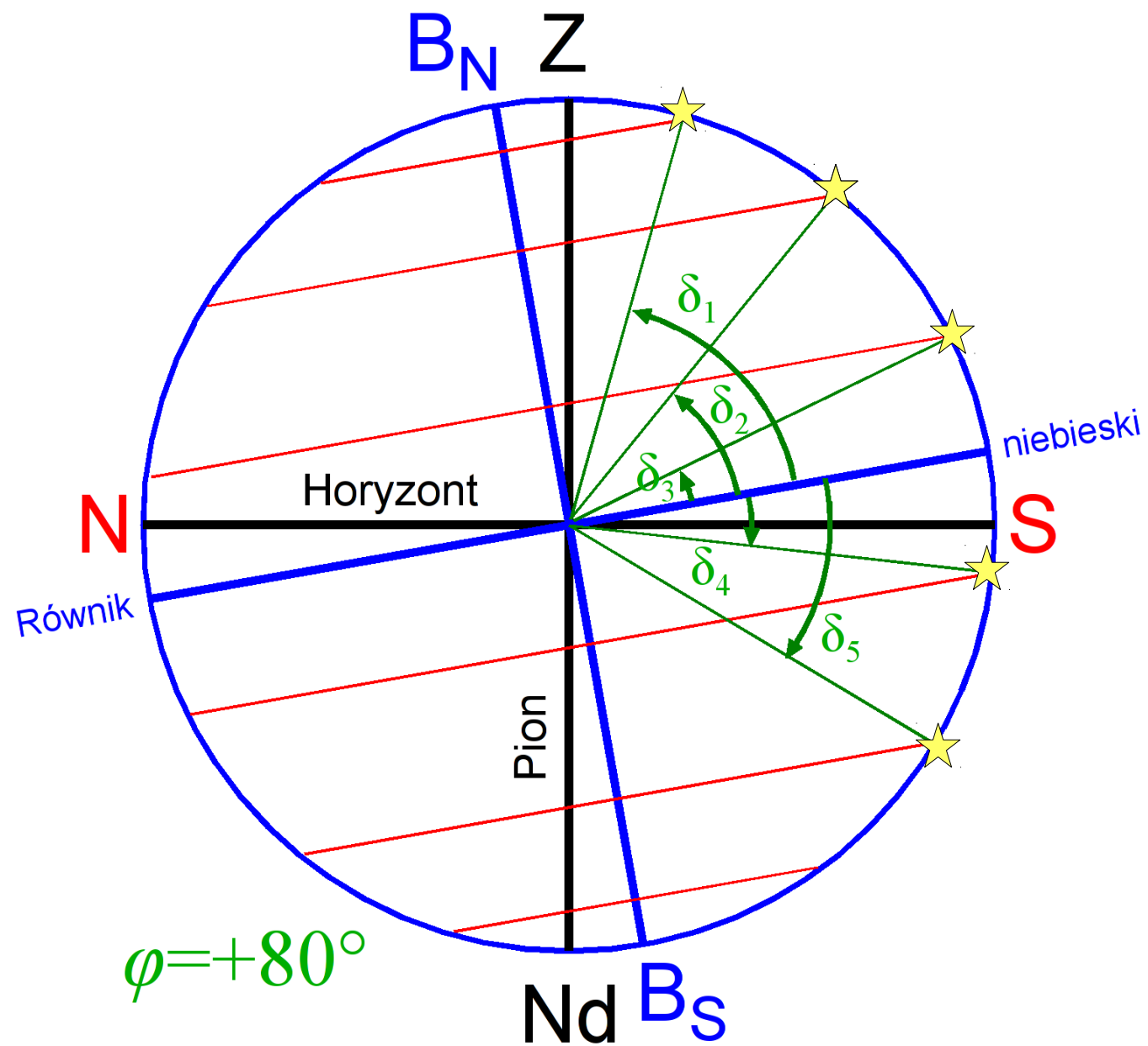
południowy
biegun świata

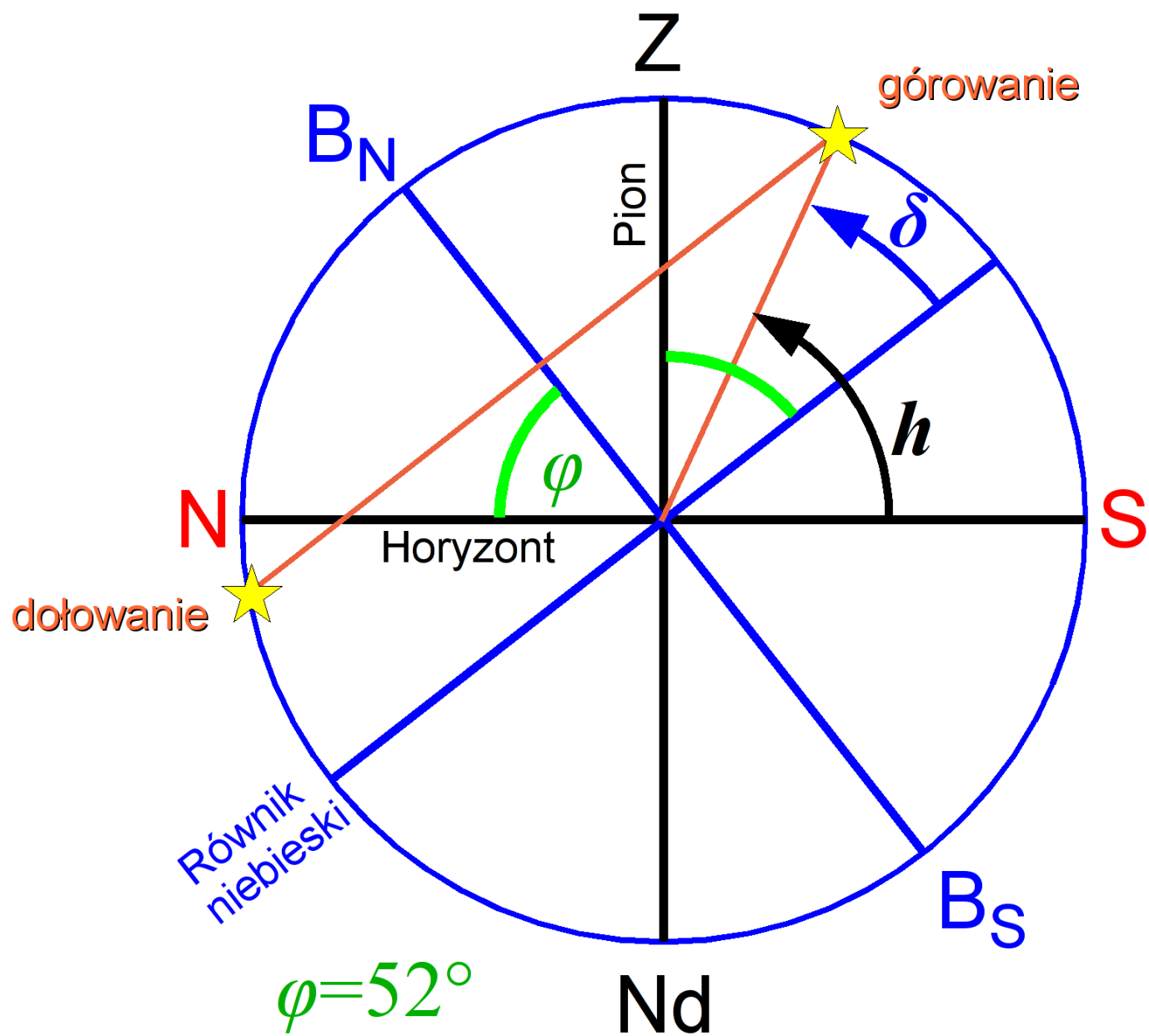
**Deklinacja
w układach równikowych**

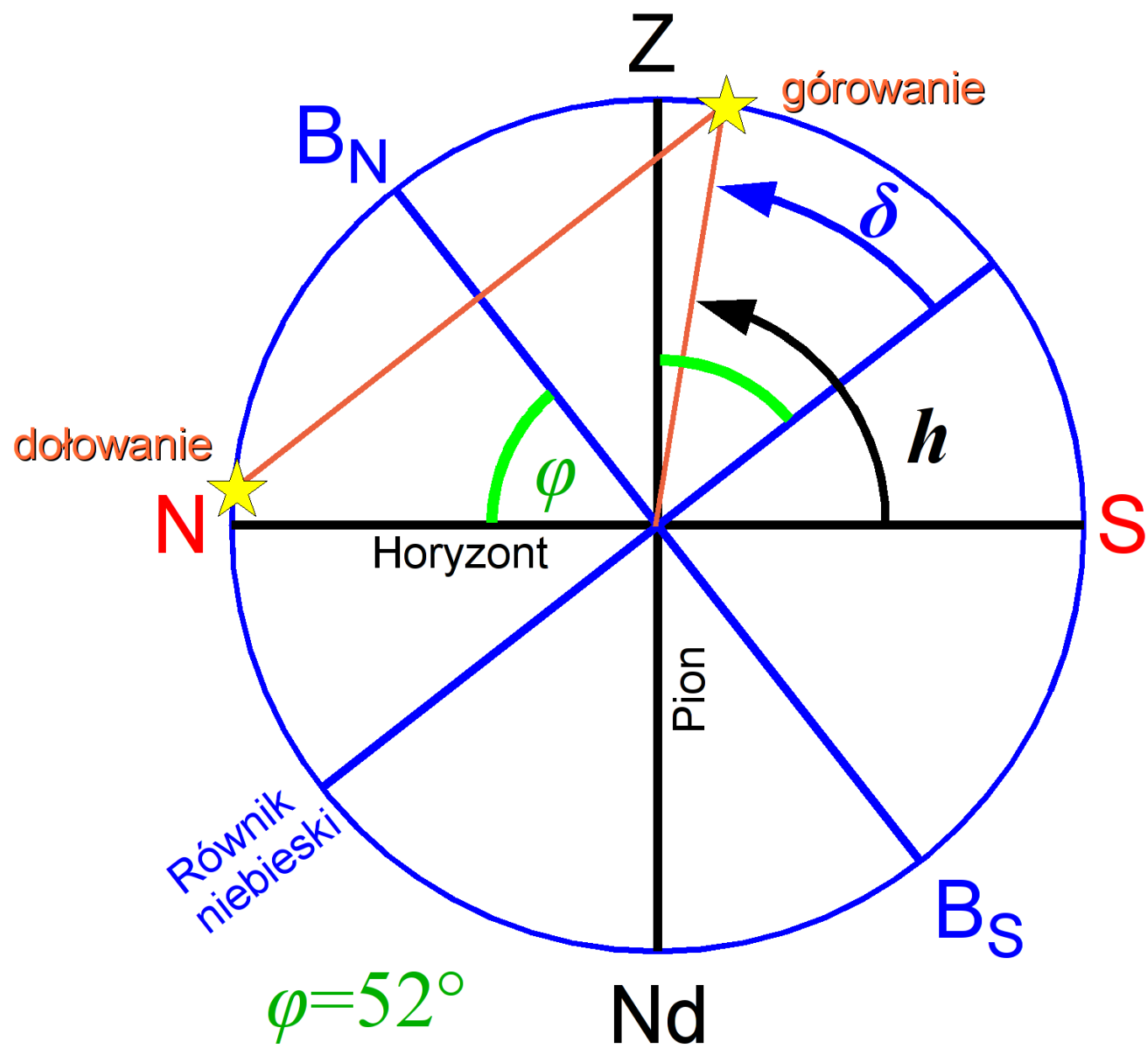


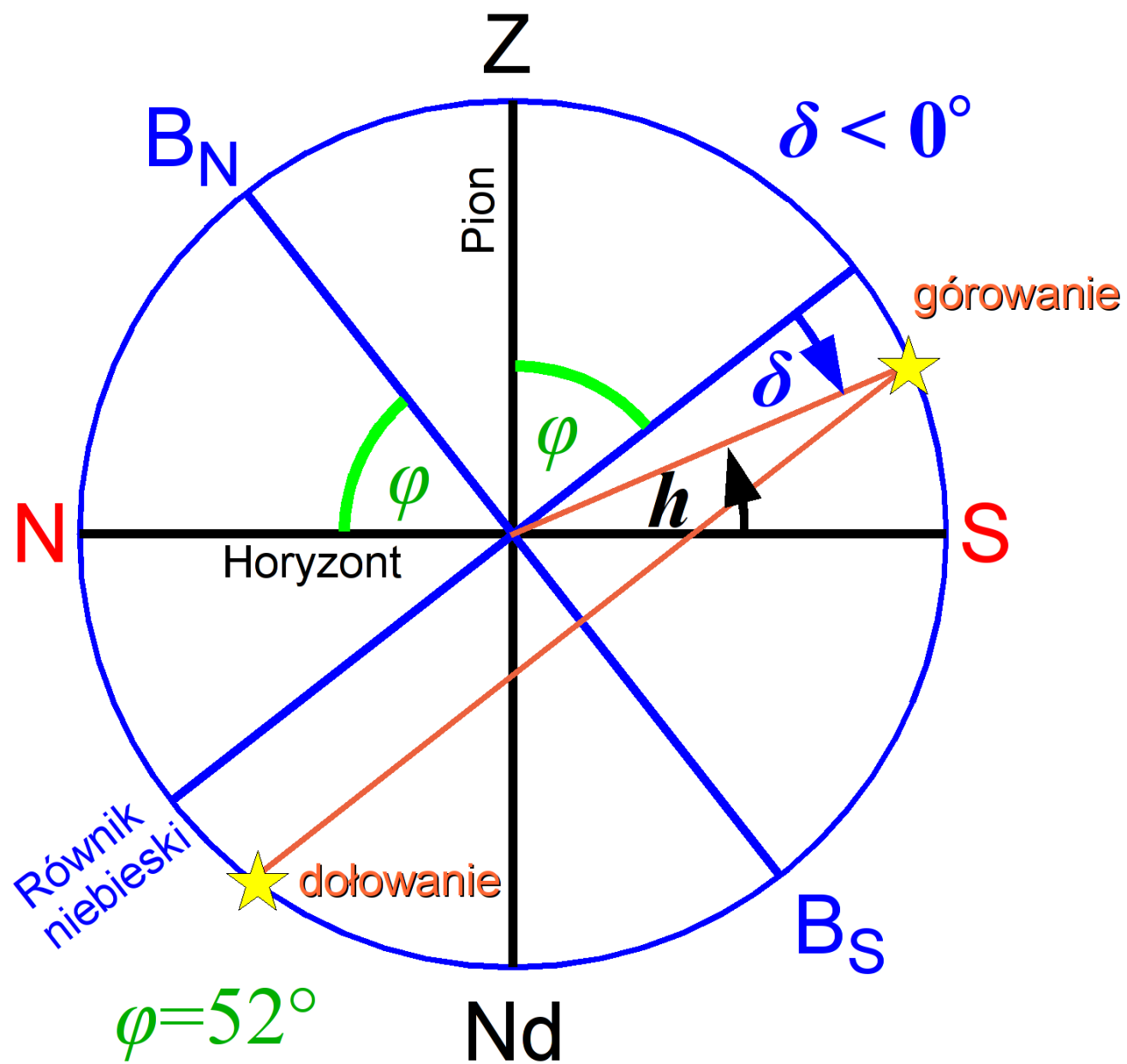


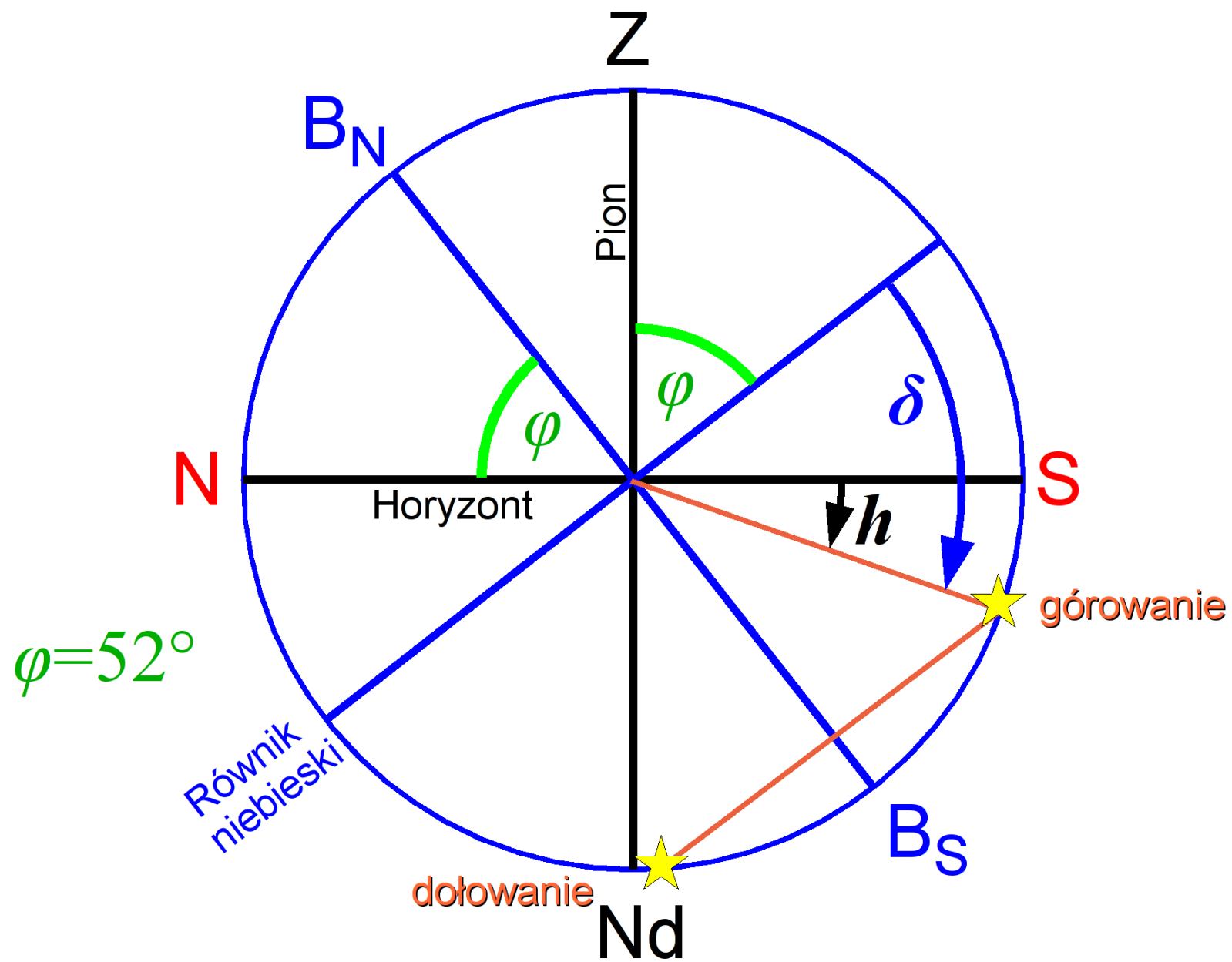


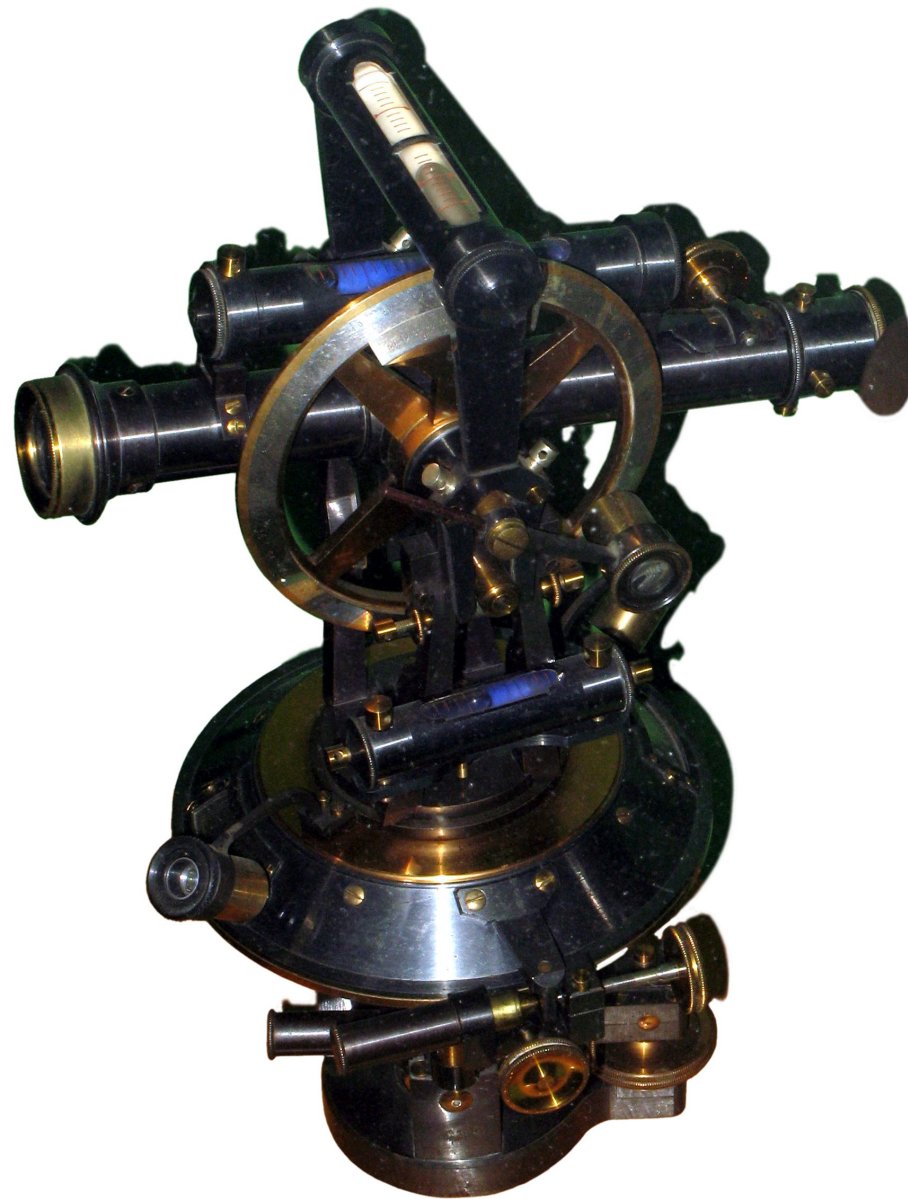




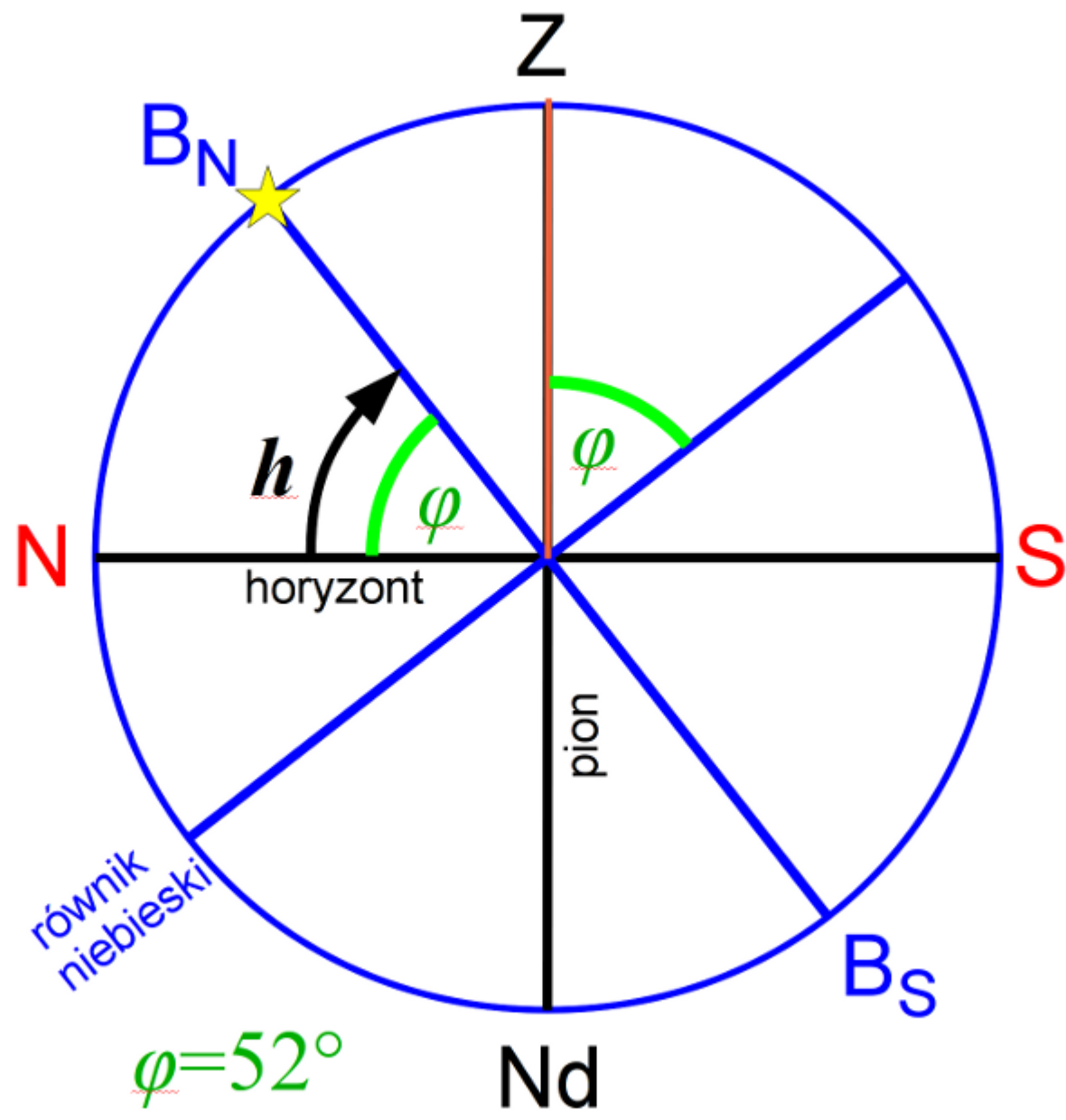




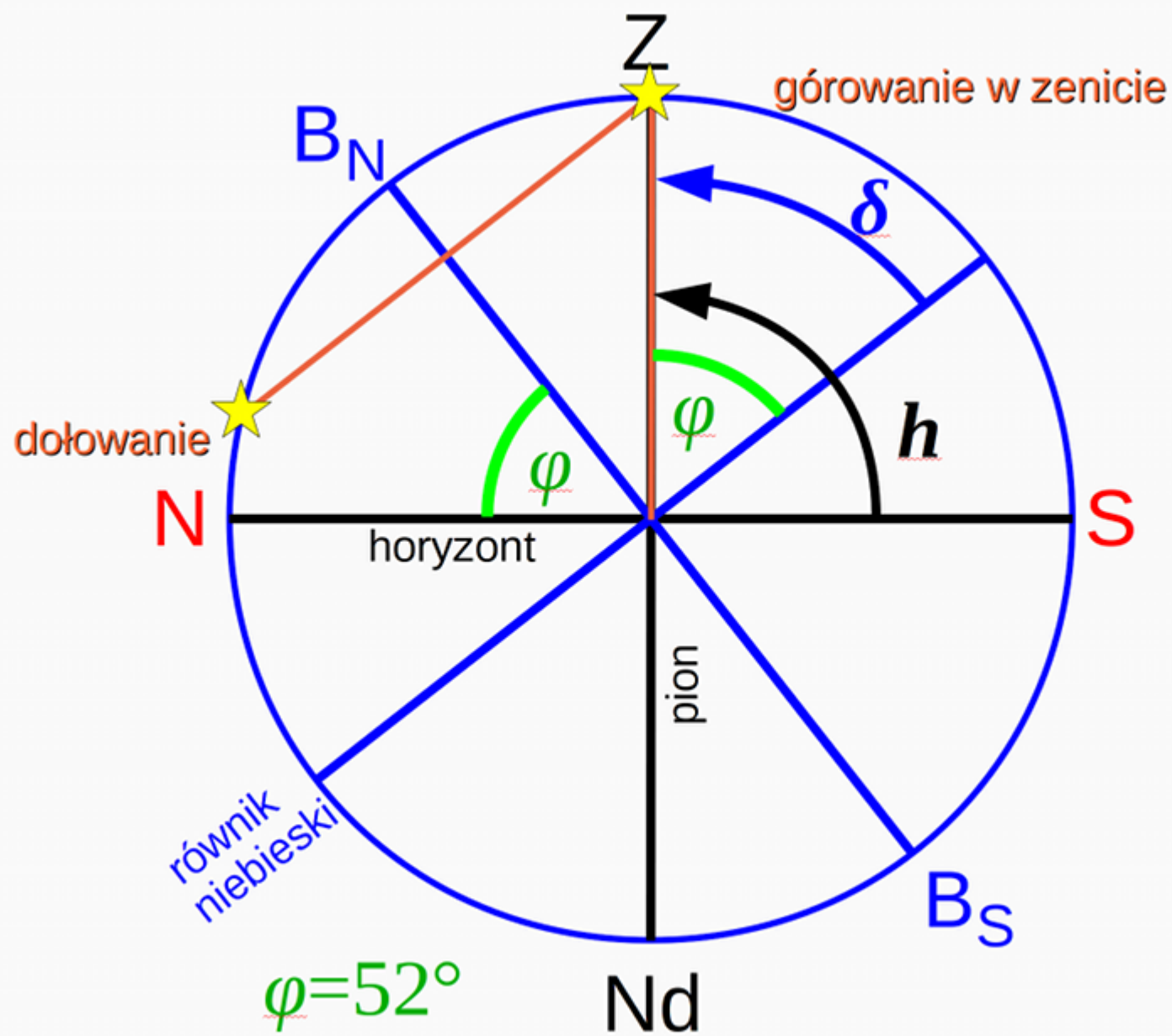


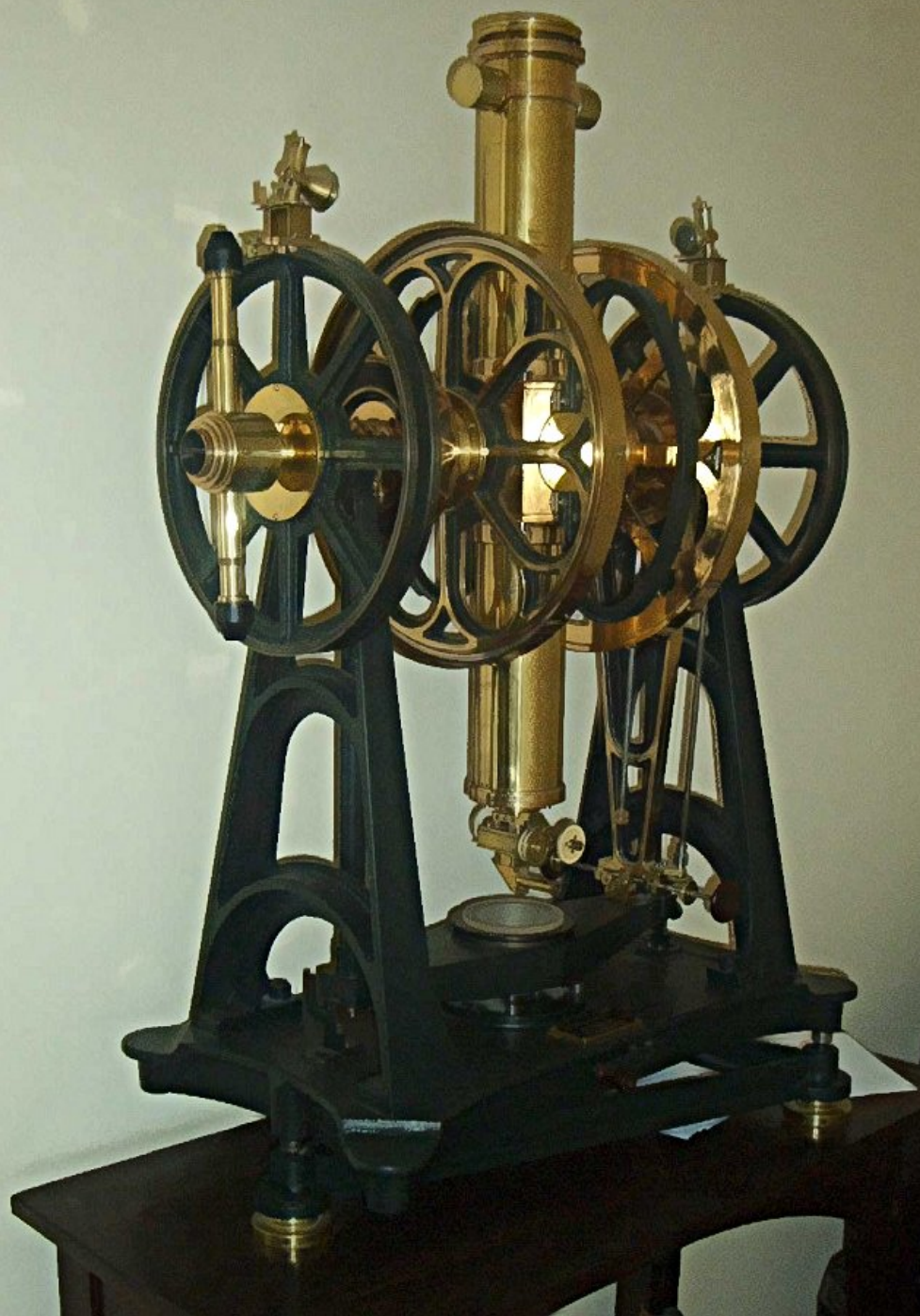


by: Rama

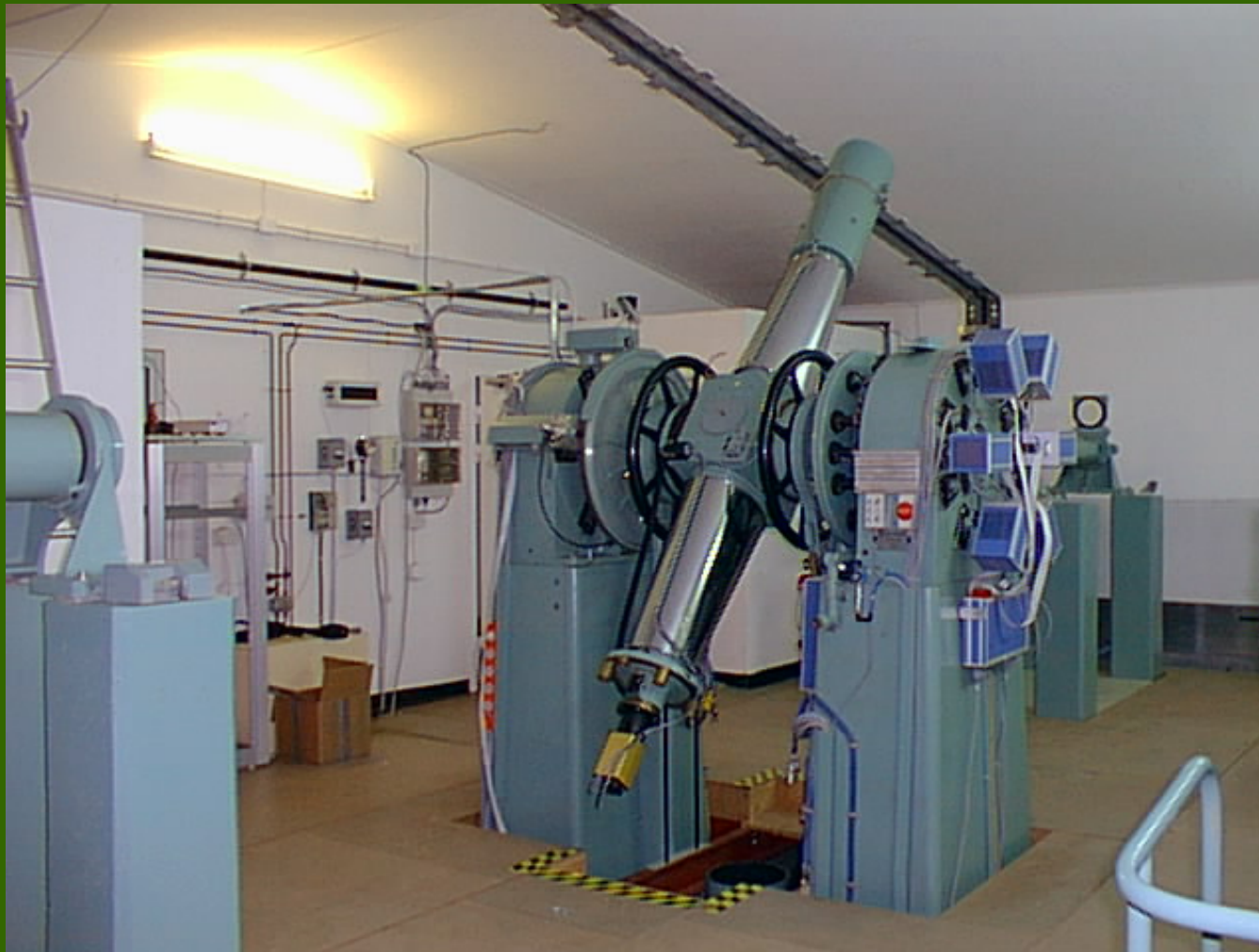




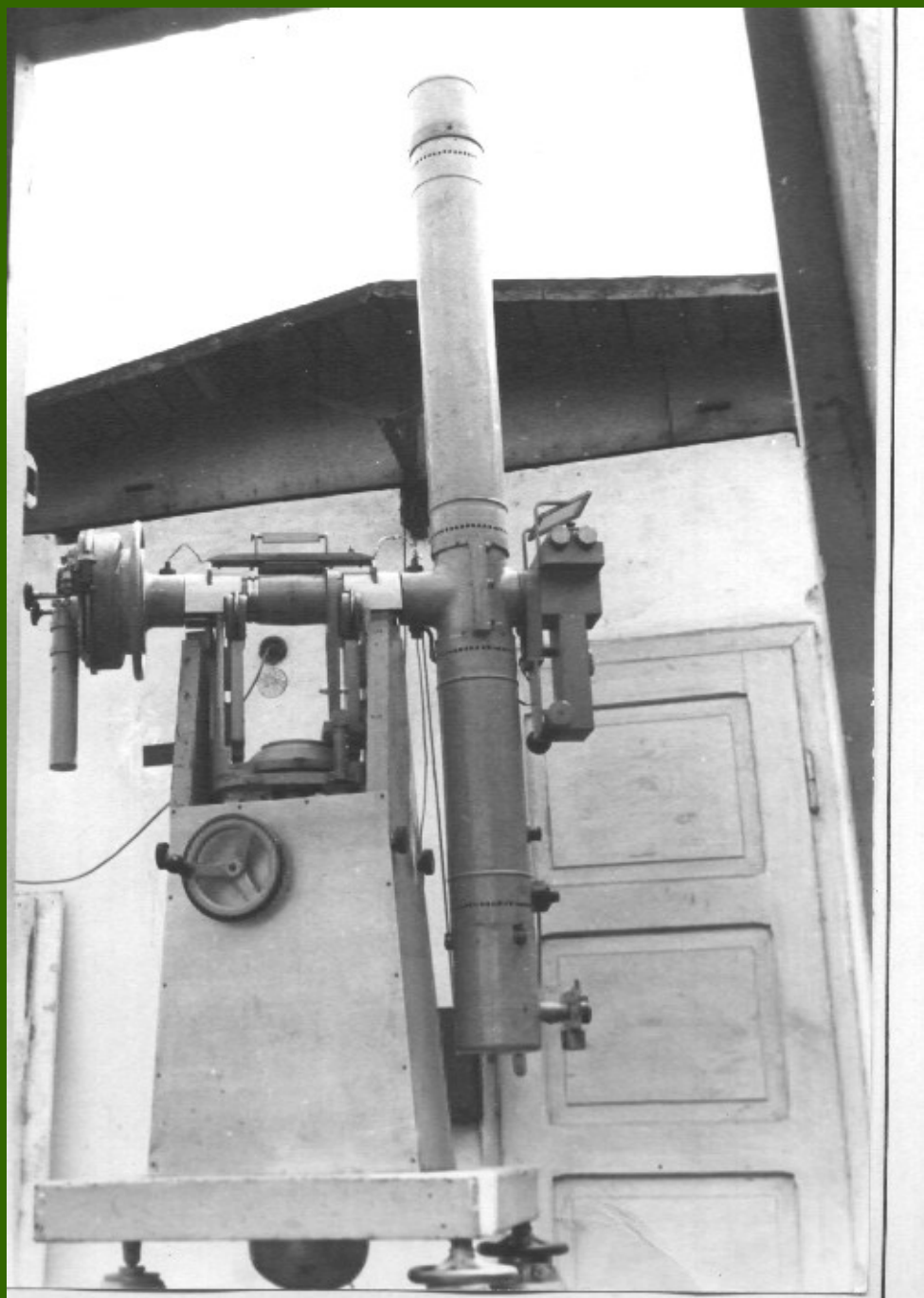




**Instrument
przejściowy
obserwatorium
poznańskiego.**

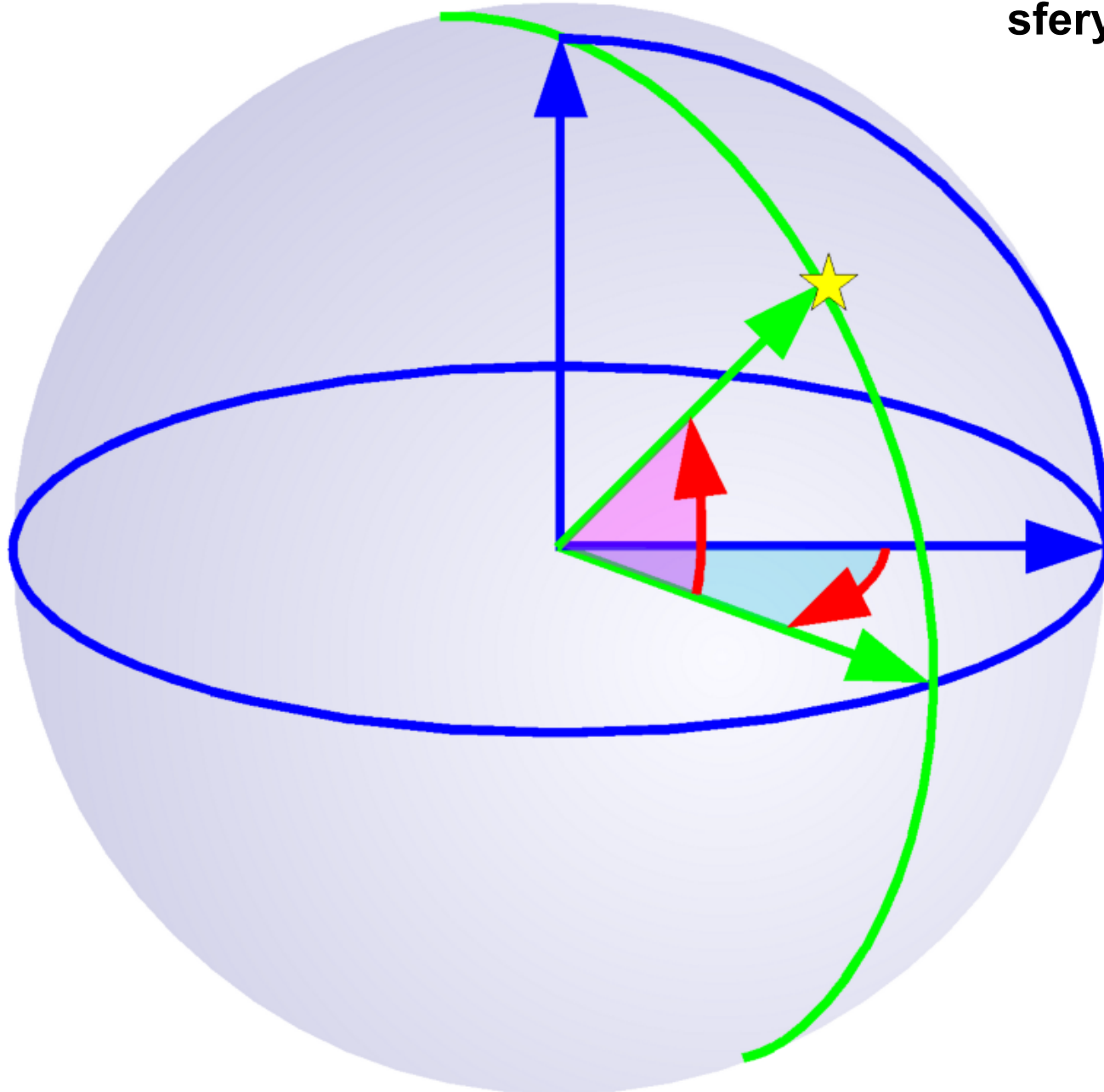


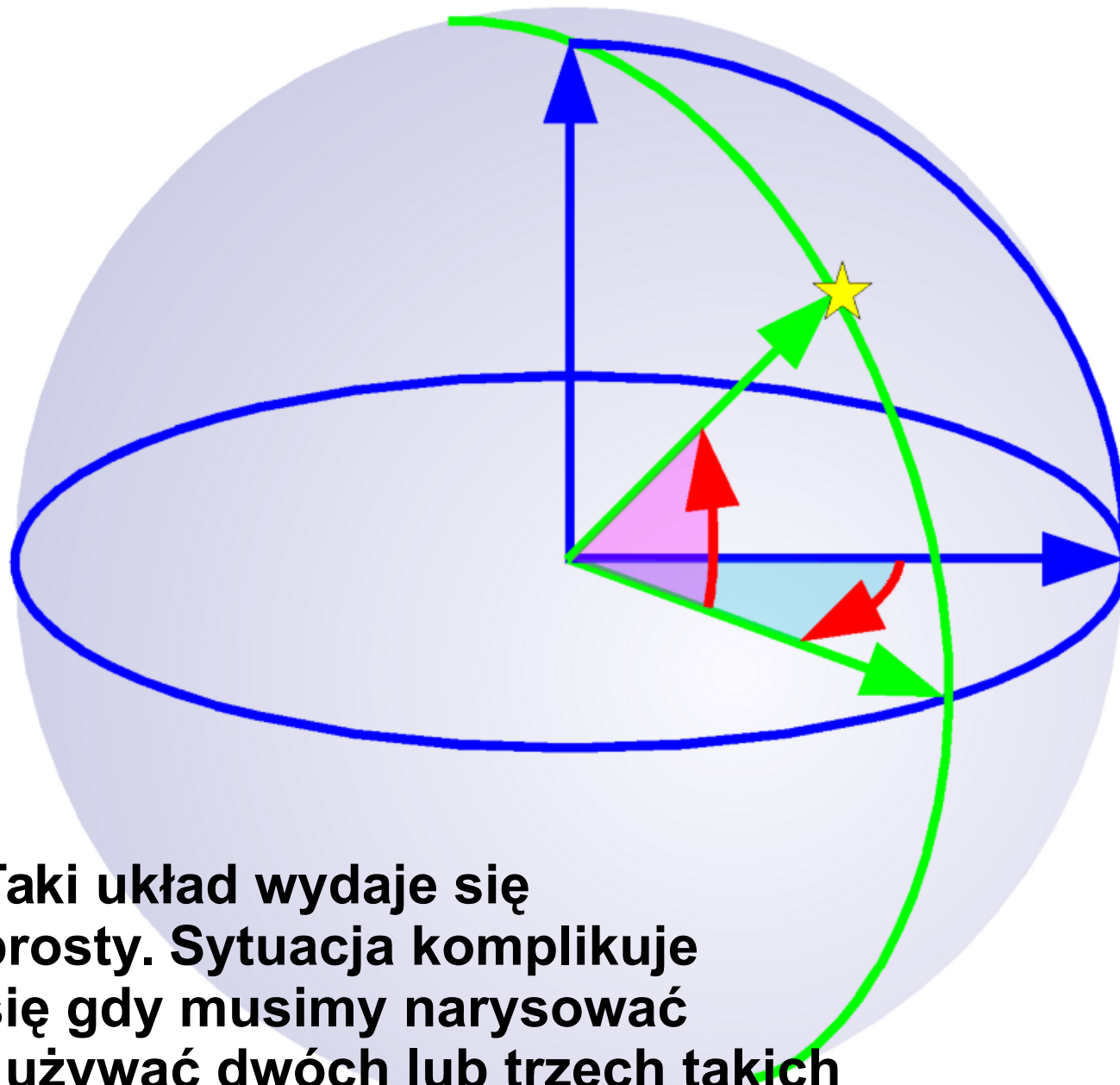
**Carlsberg Meridian Telescope
picture taken by Dafydd Wyn Evans.**



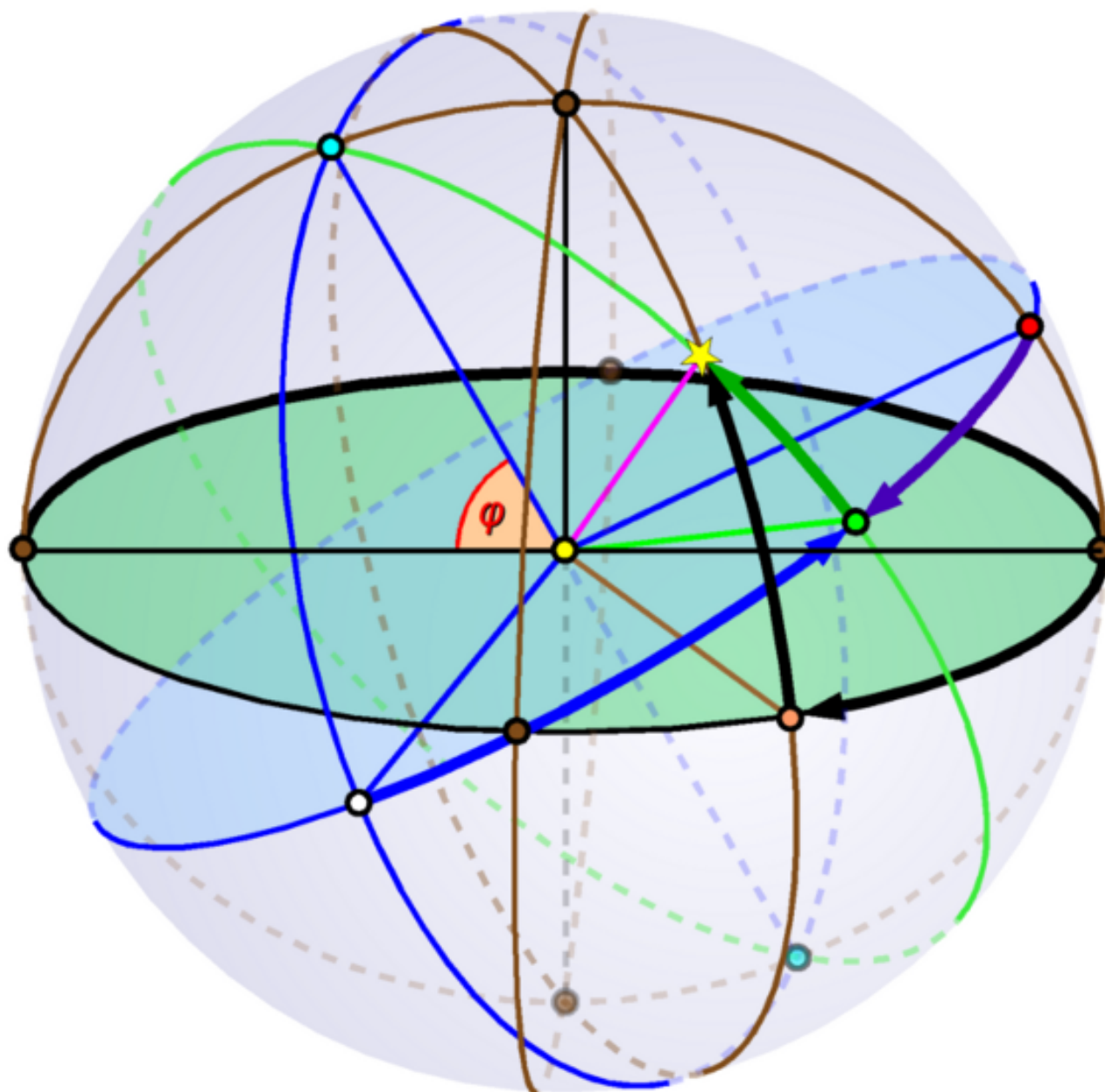
Teleskop zenitalny obserwatorium poznańskiego

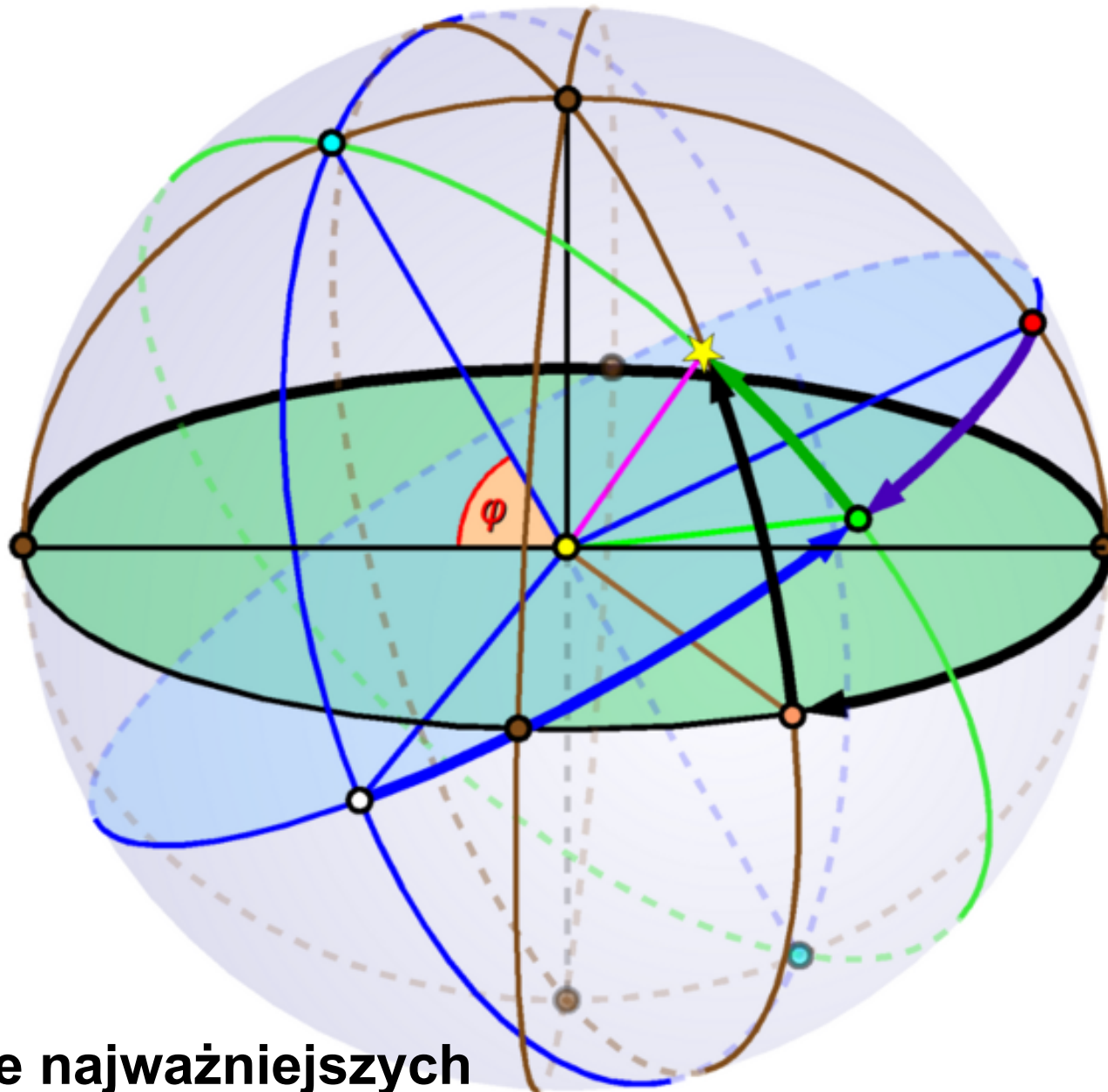
Układ współrzędnych sferycznych



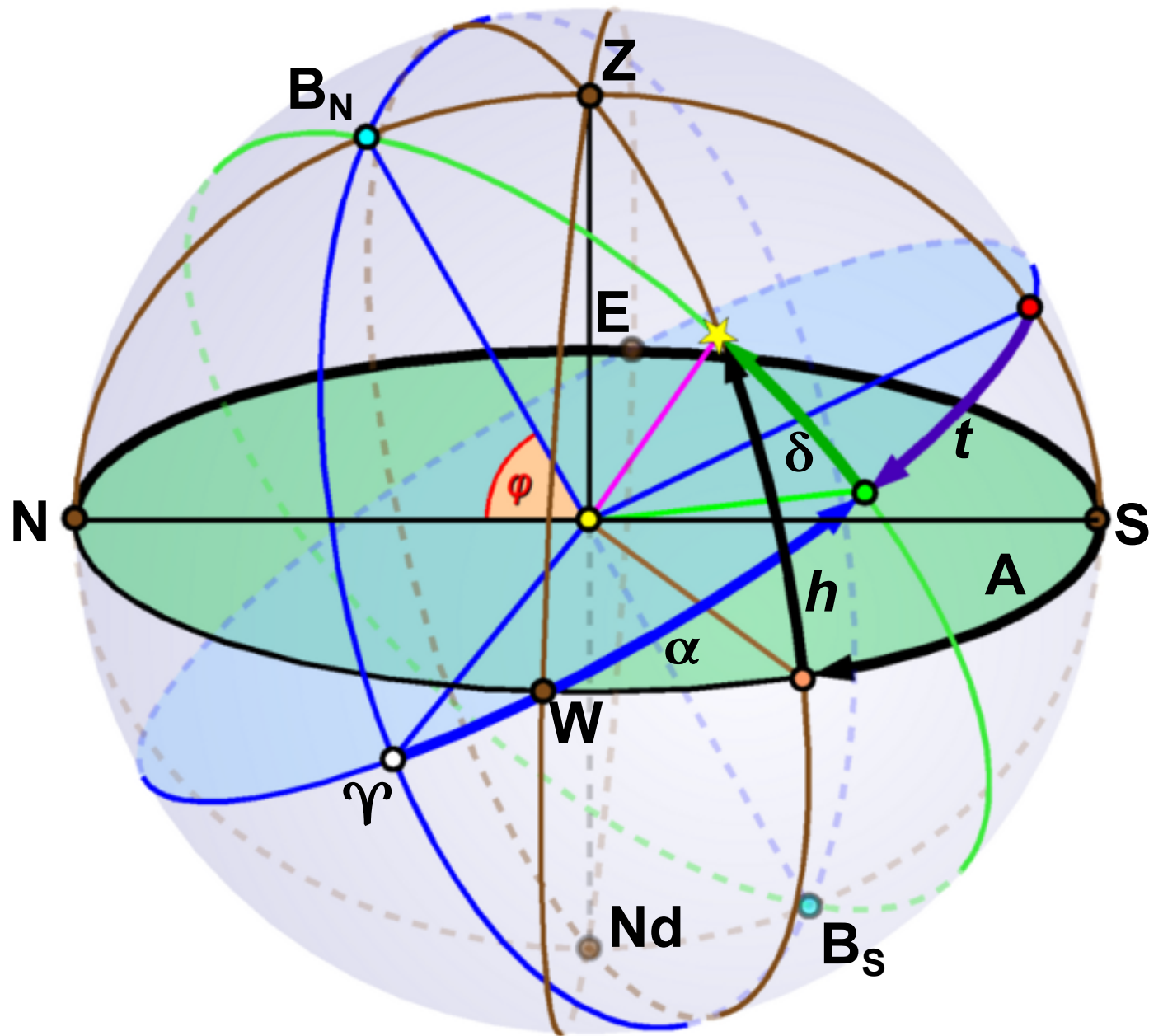


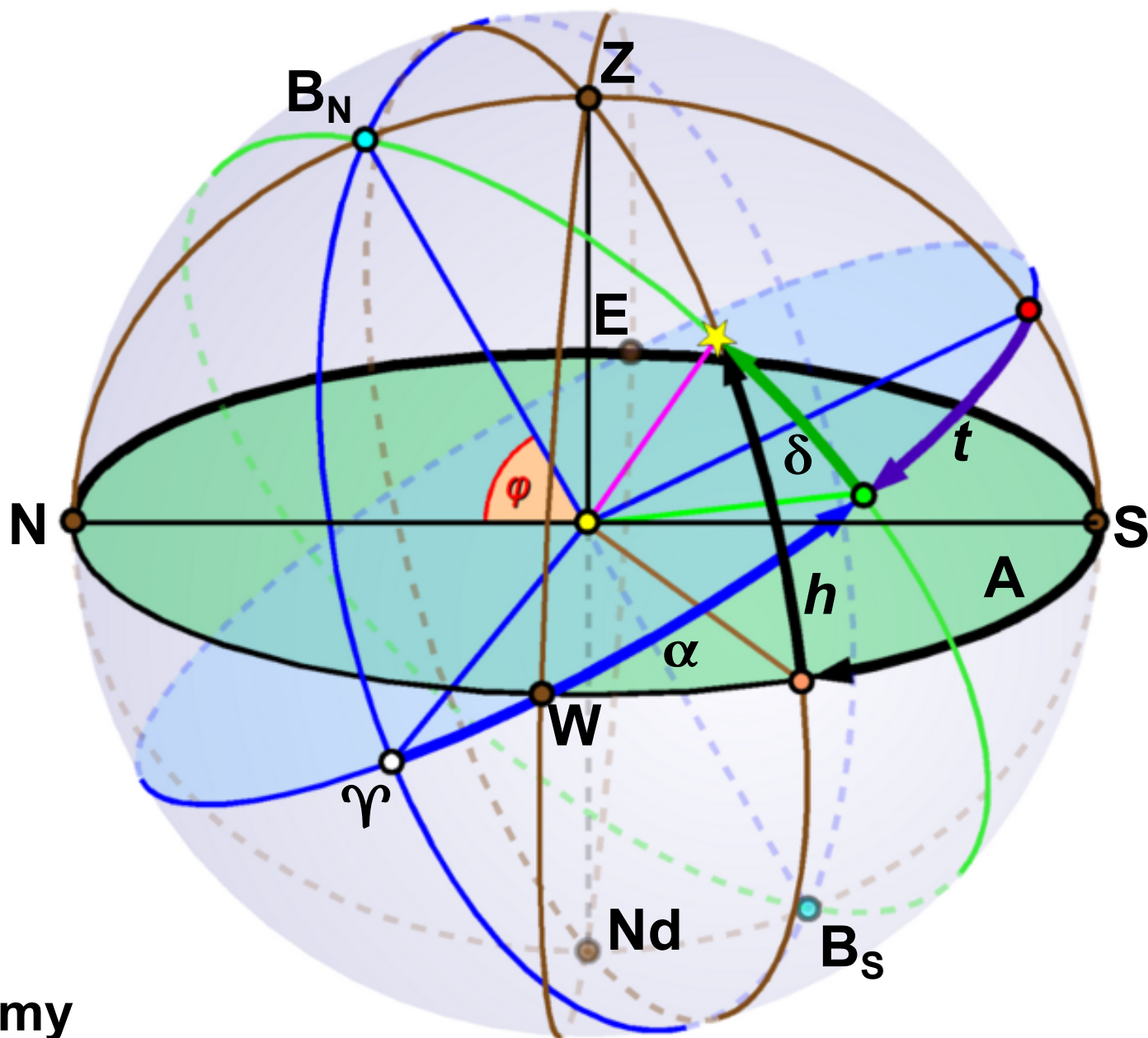
Taki układ wydaje się prosty. Sytuacja komplikuje się gdy musimy narysować i używać dwóch lub trzech takich układów jednocześnie...



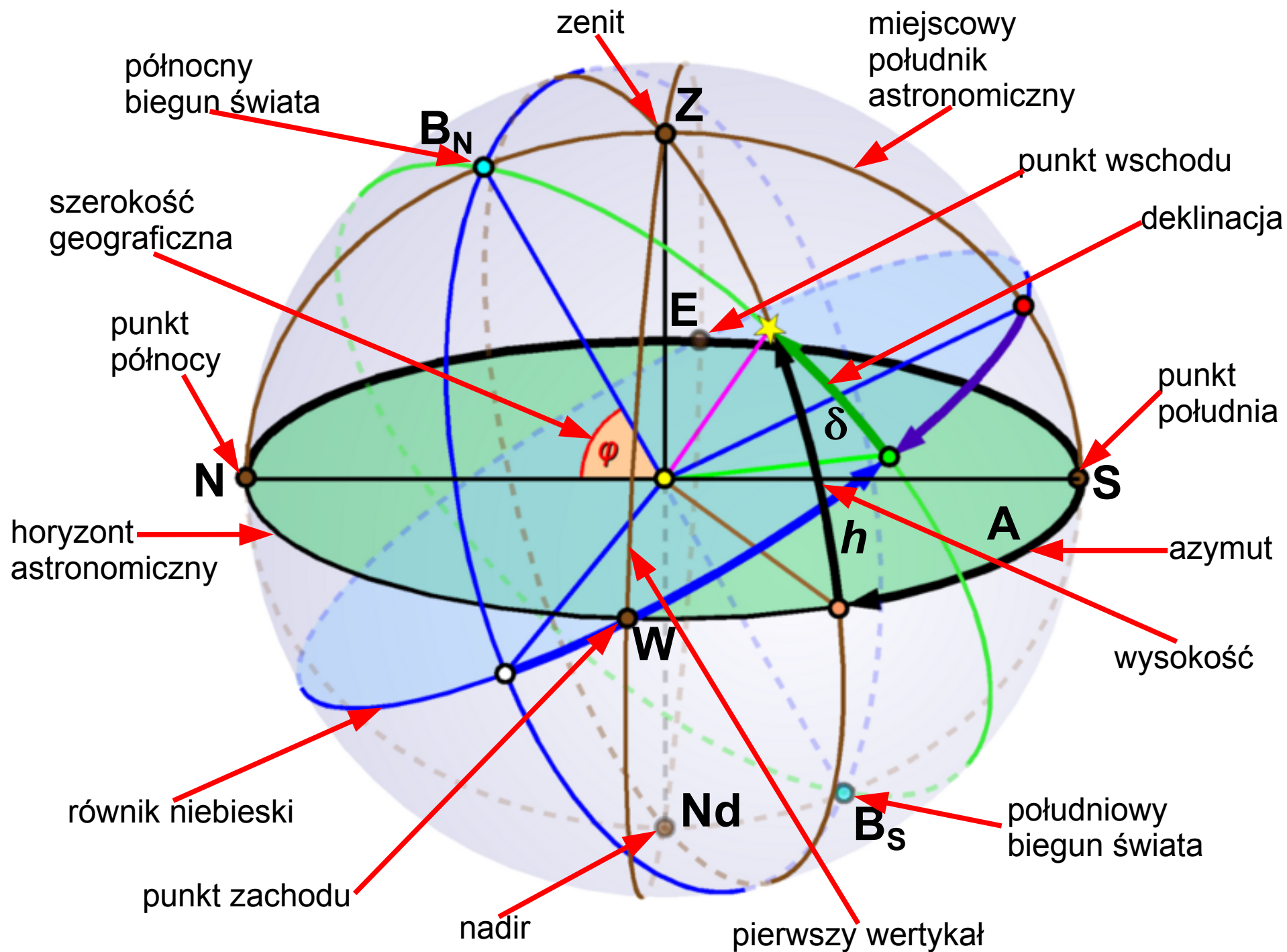


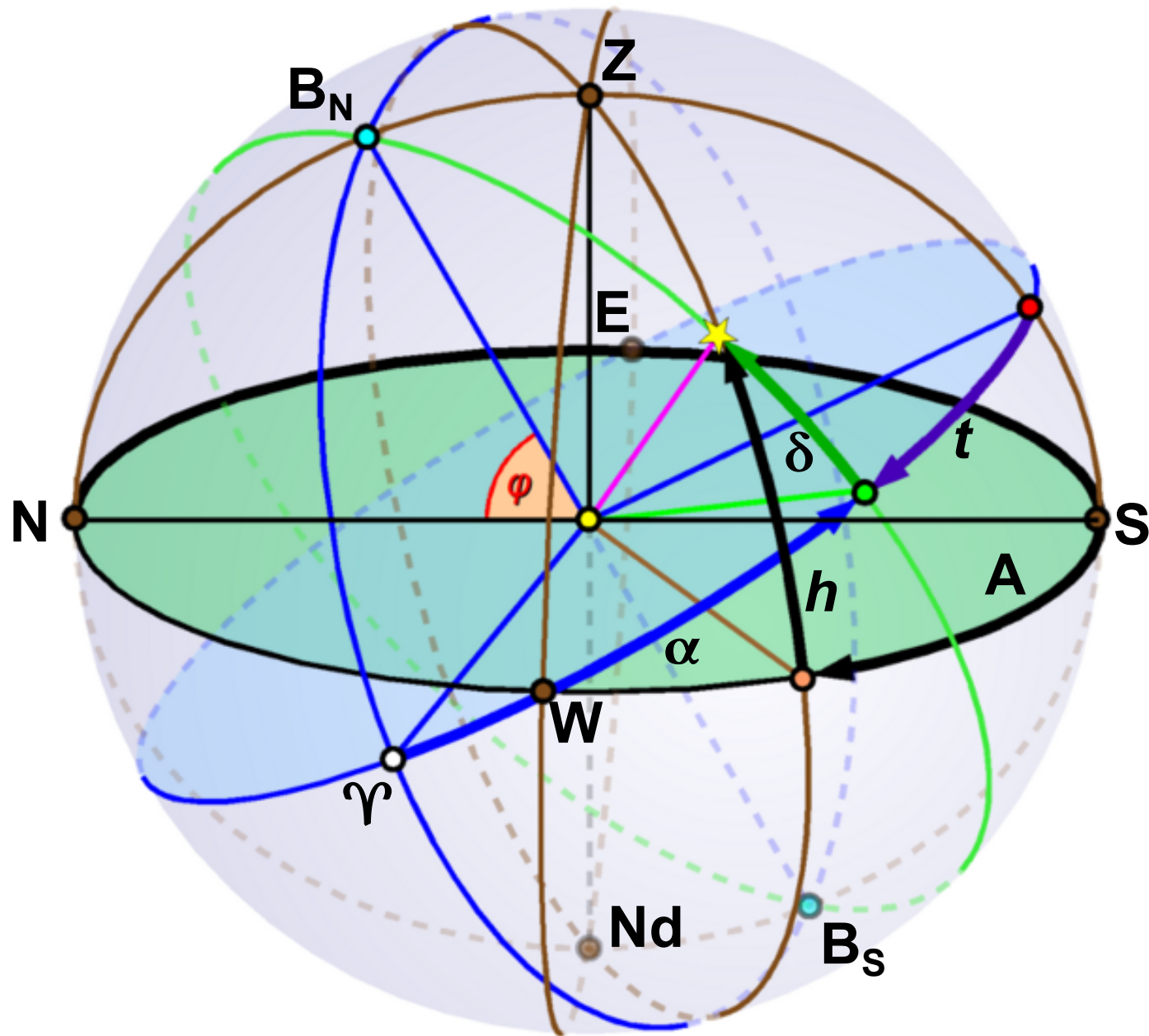
Oznaczenie najważniejszych punktów i kątów niewiele pomoże...

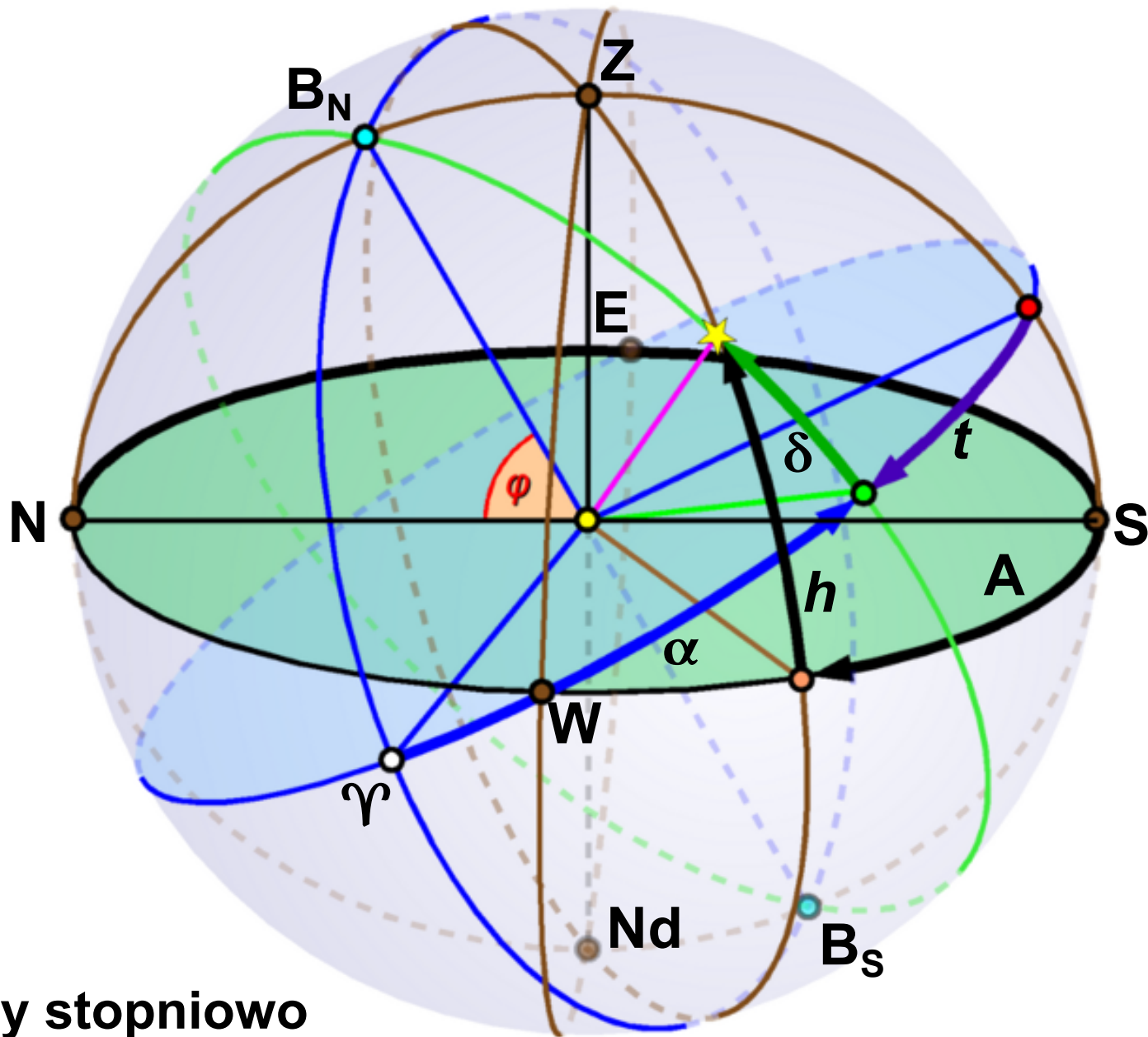




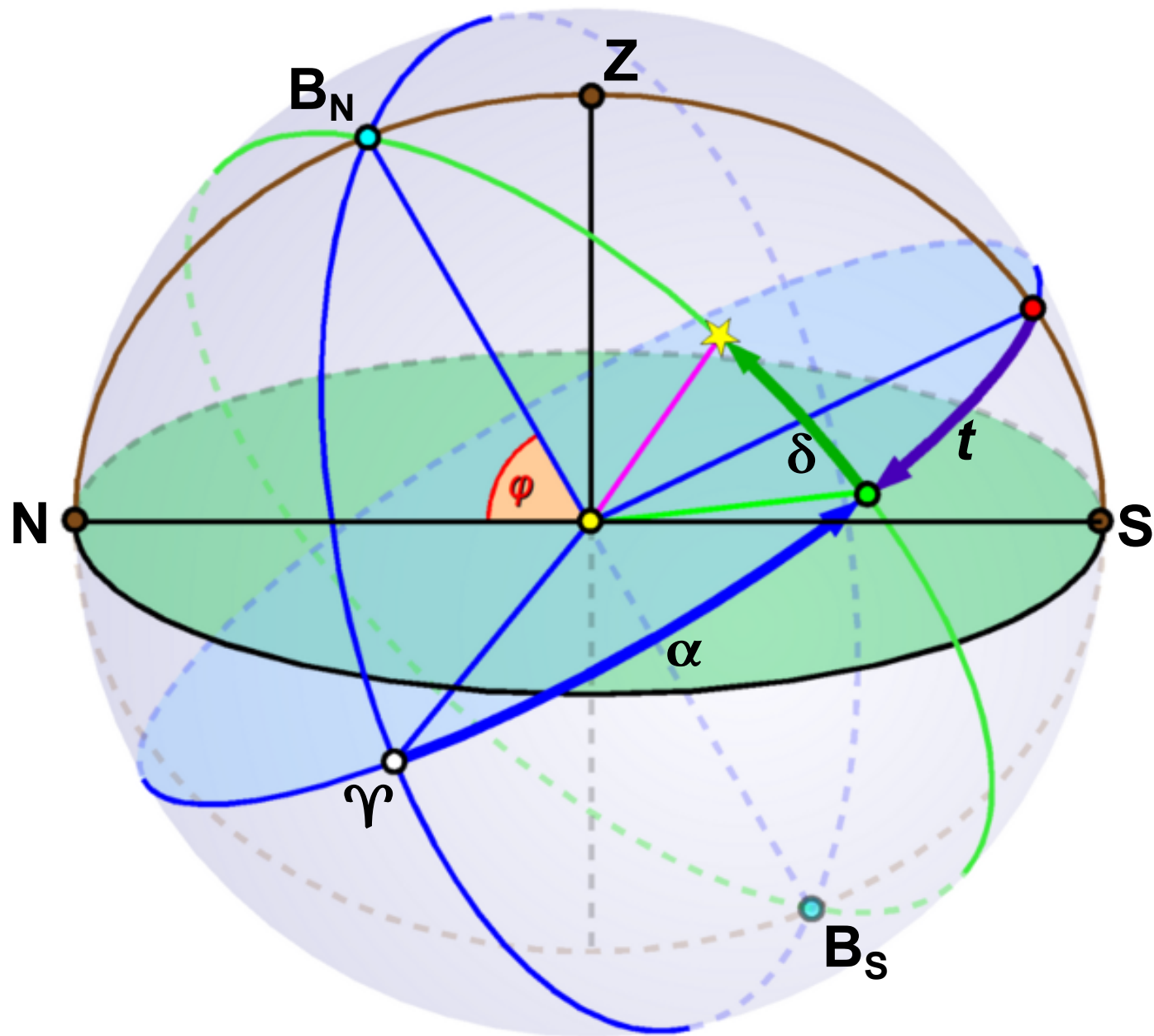
Poznaliśmy
już ponad połowę...

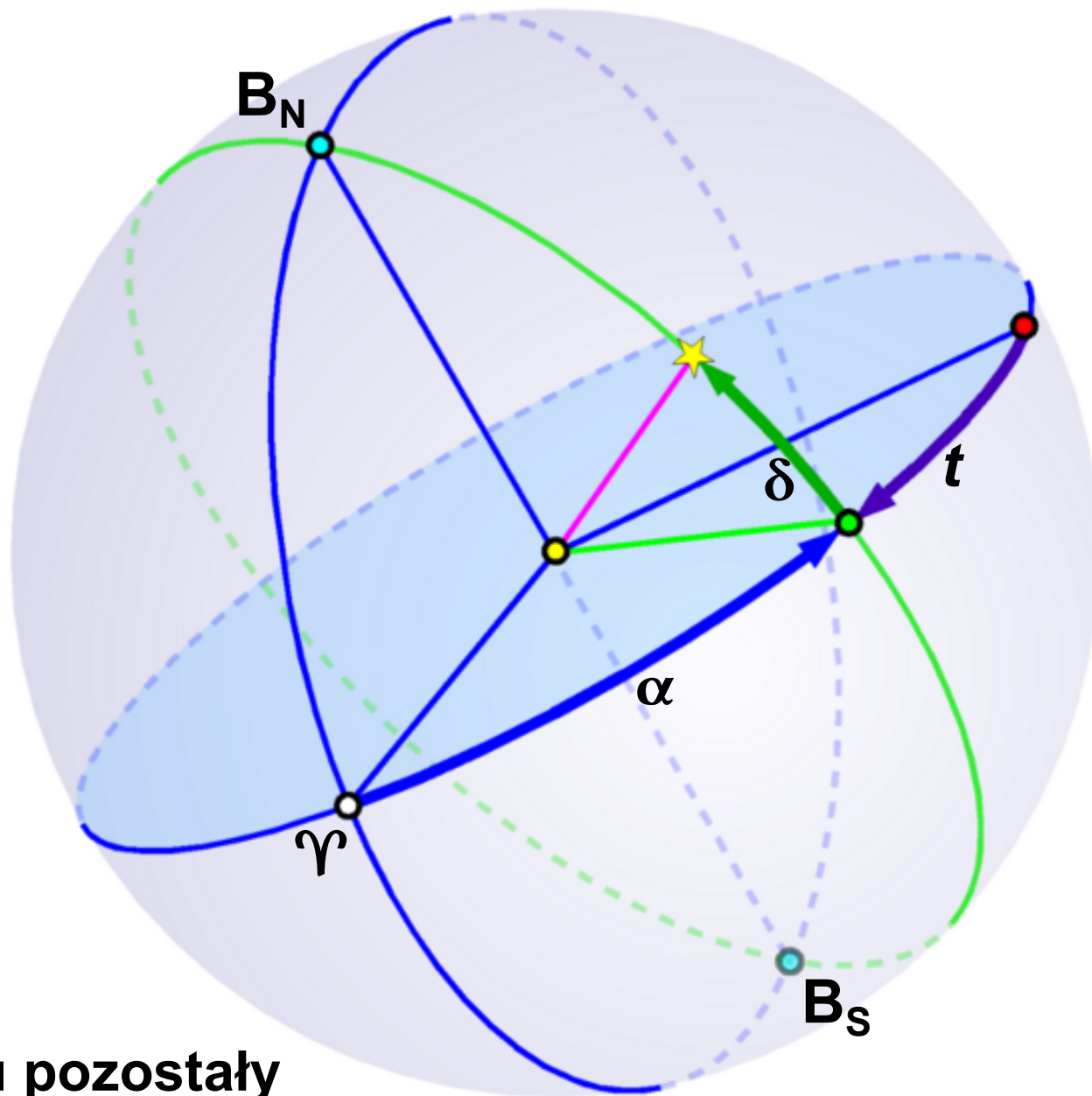




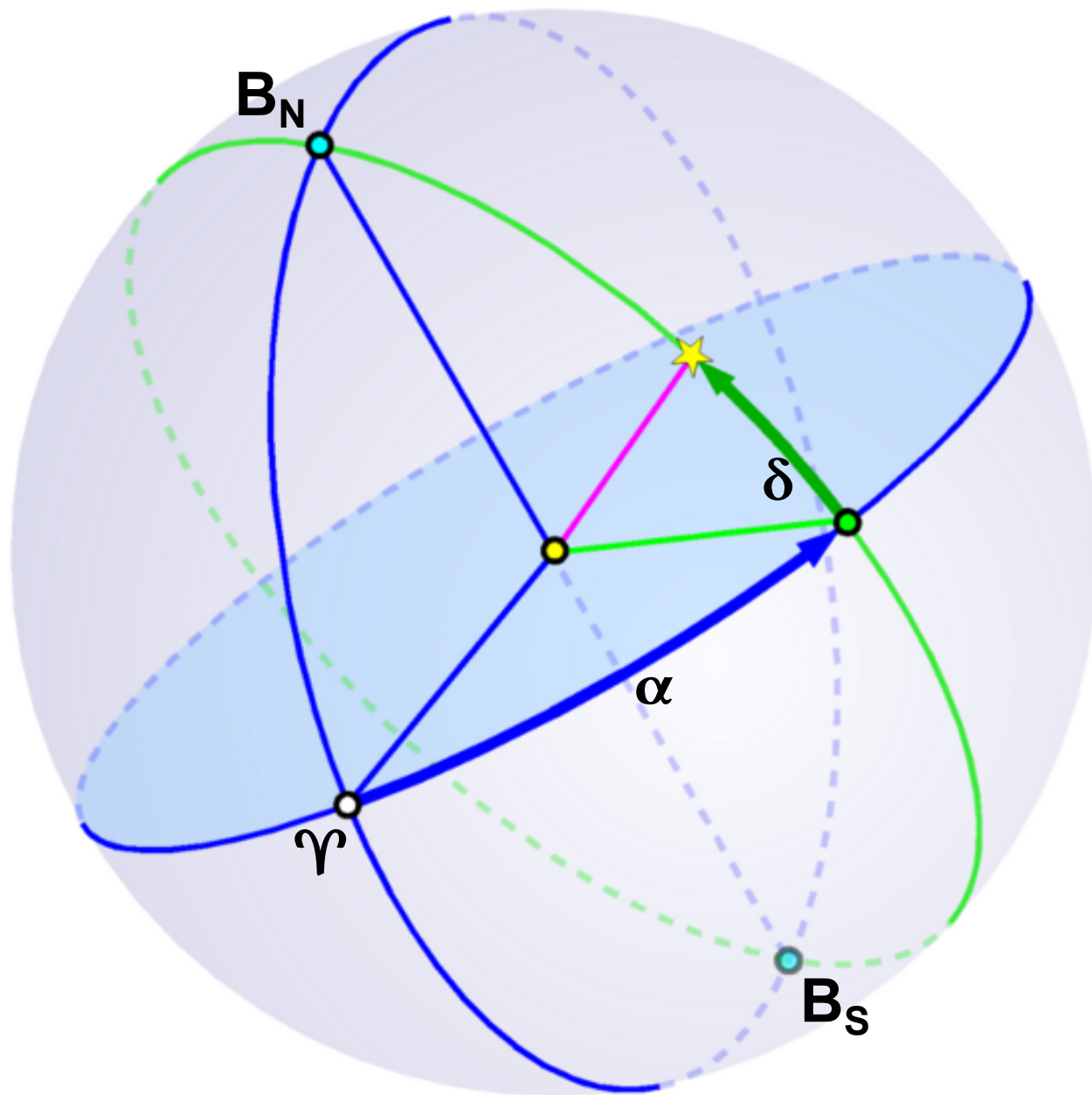


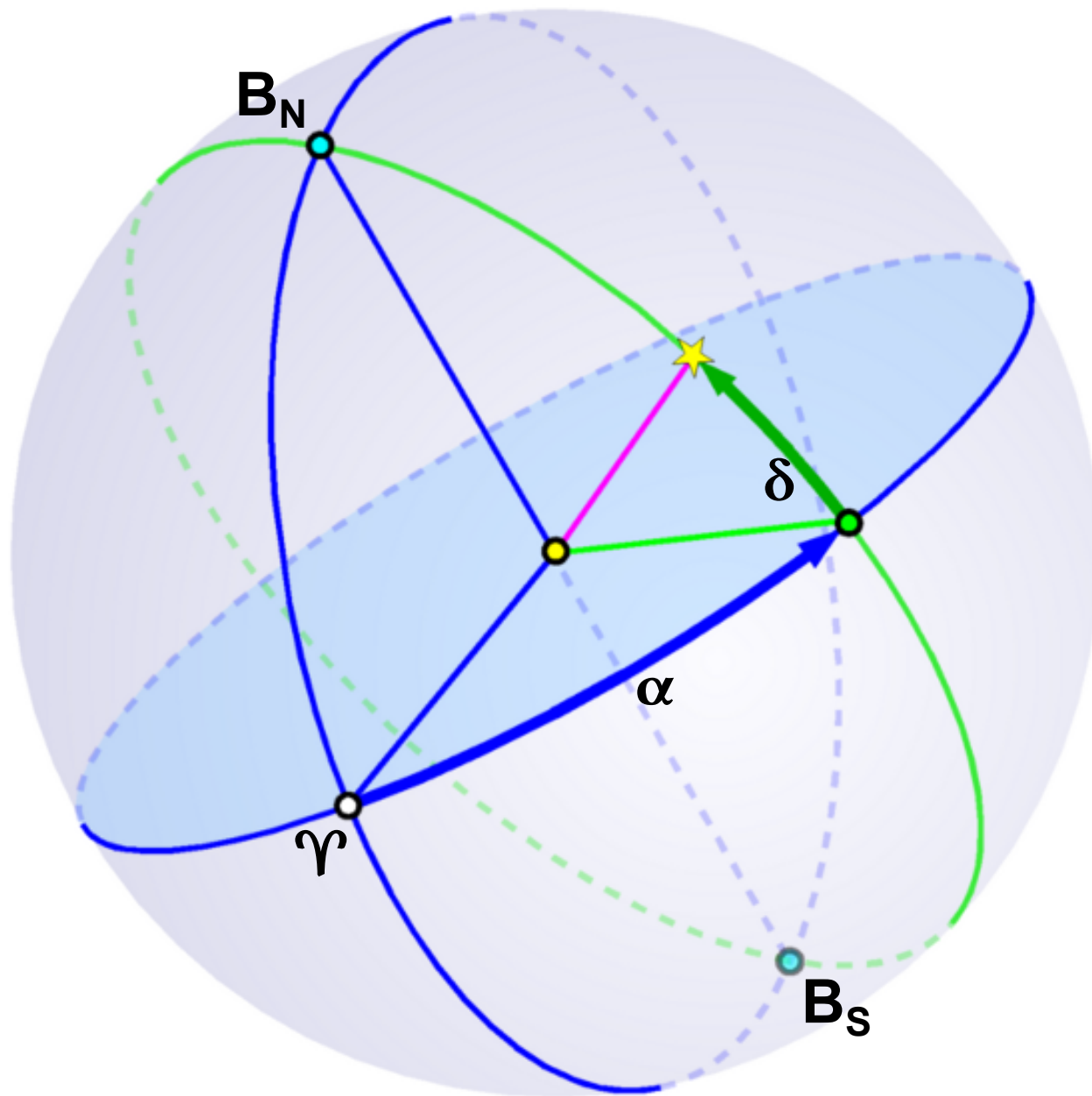
Usuwamy stopniowo
elementy układu horyzontalnego...



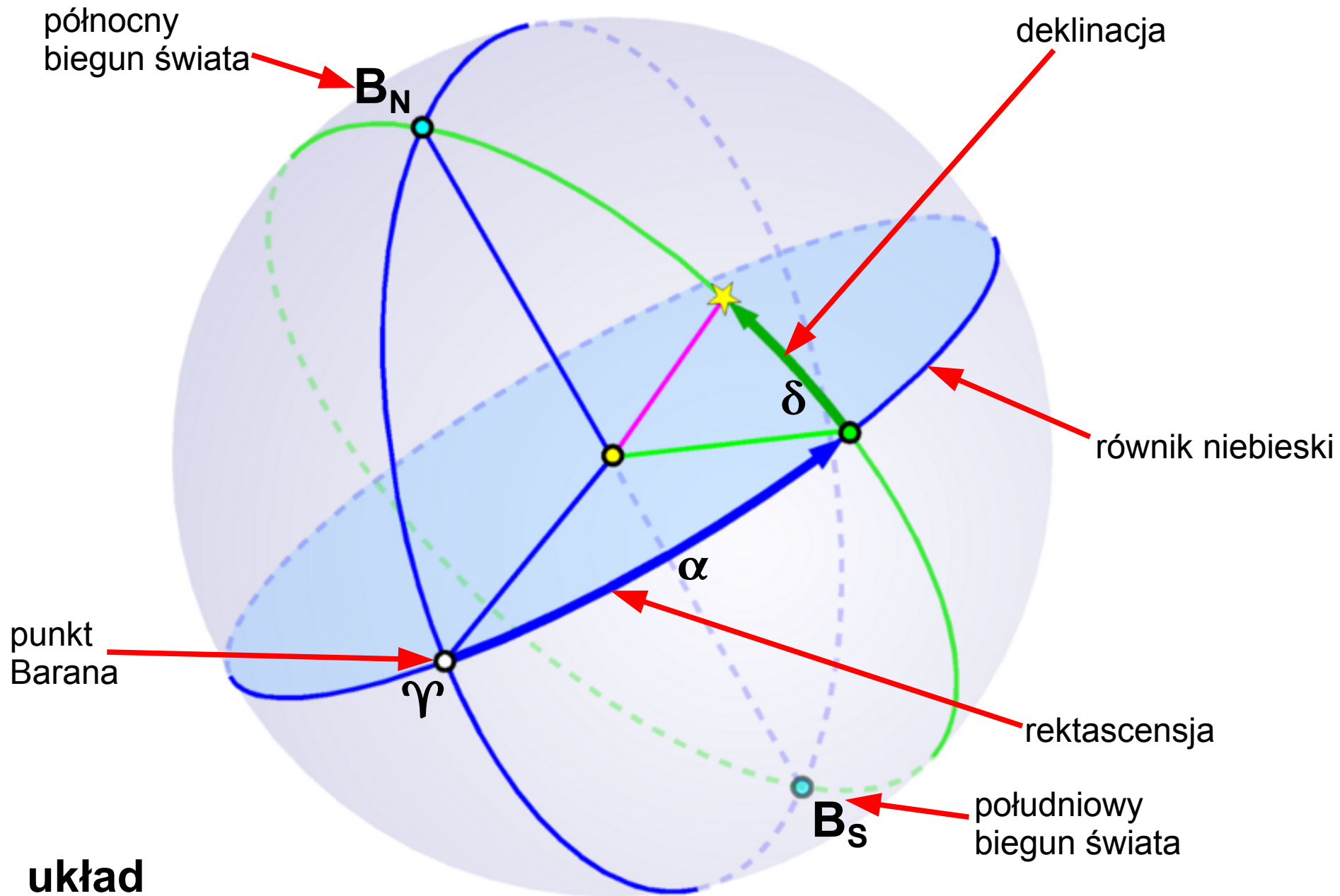


Na rysunku pozostały
tylko elementy układów równikowych...

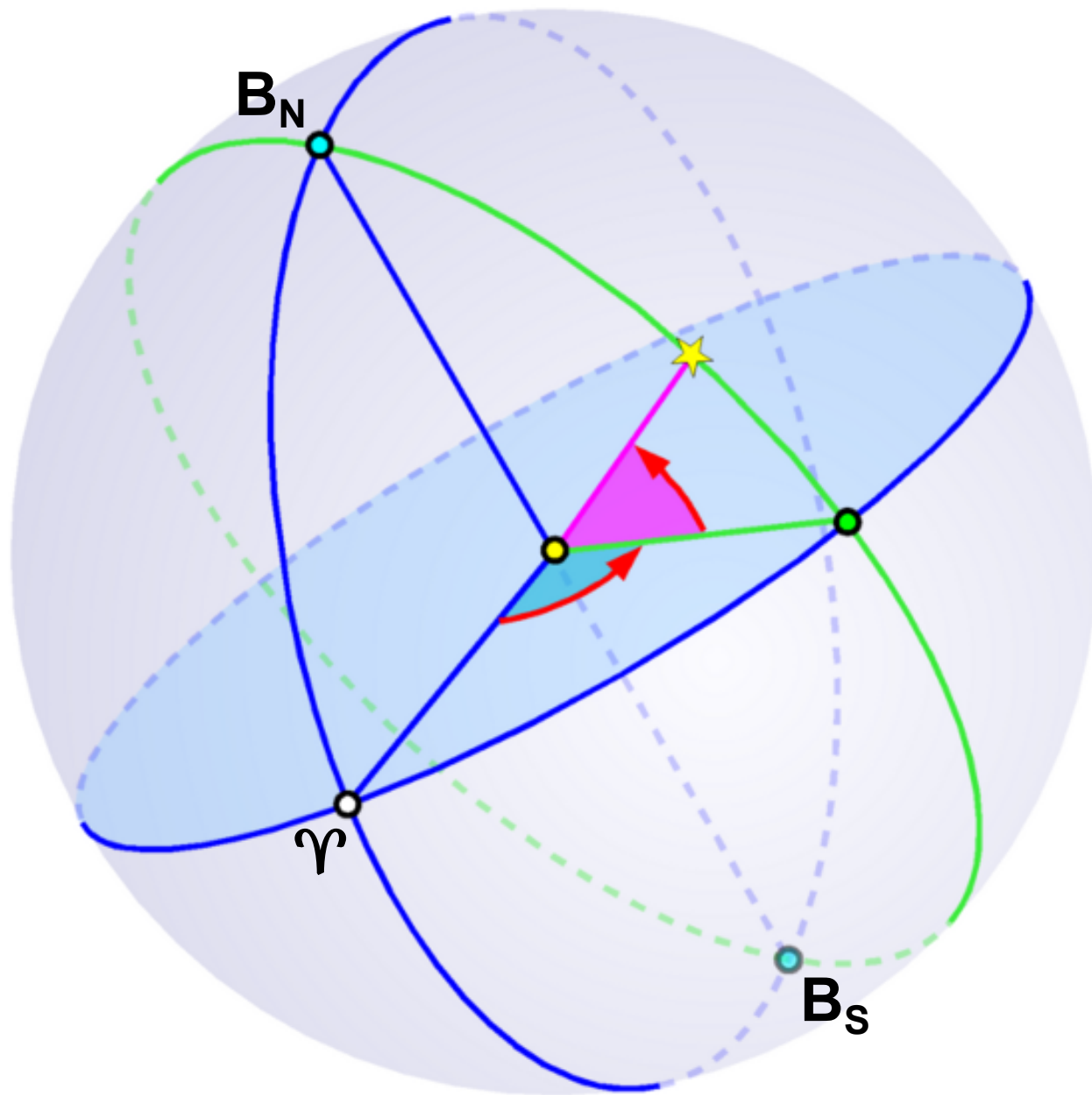


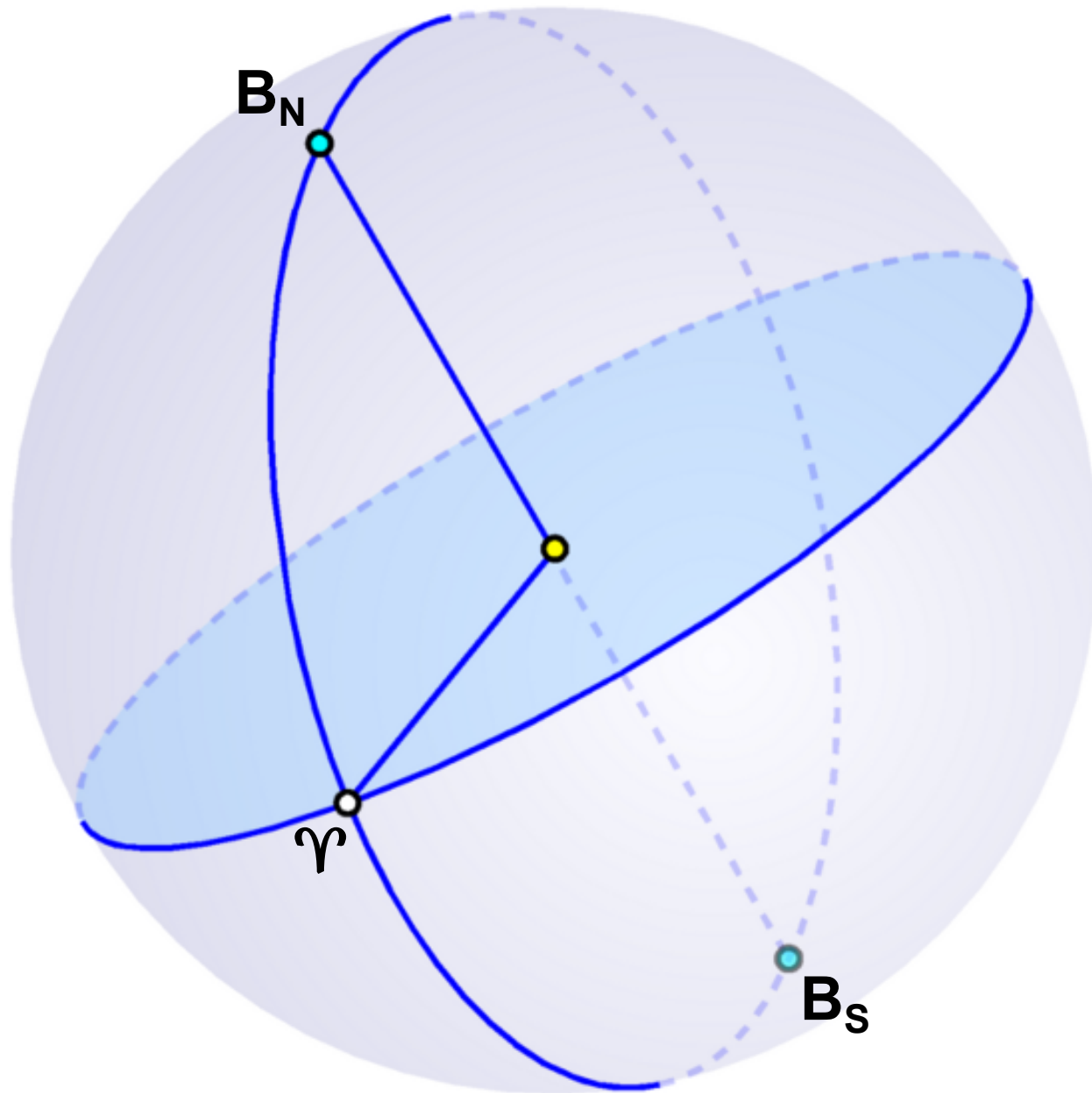


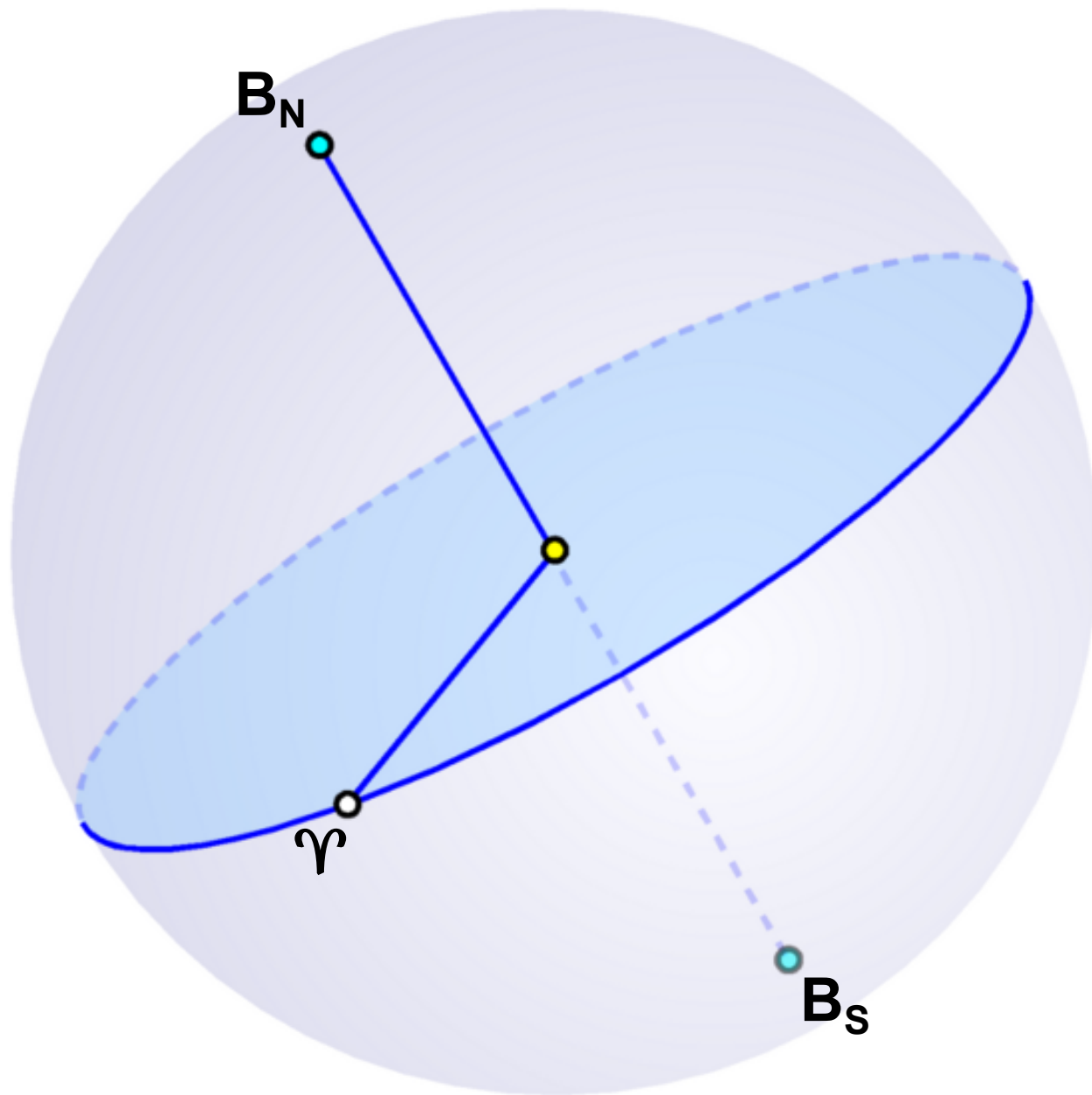
Oto układ
równikowy równonocny...

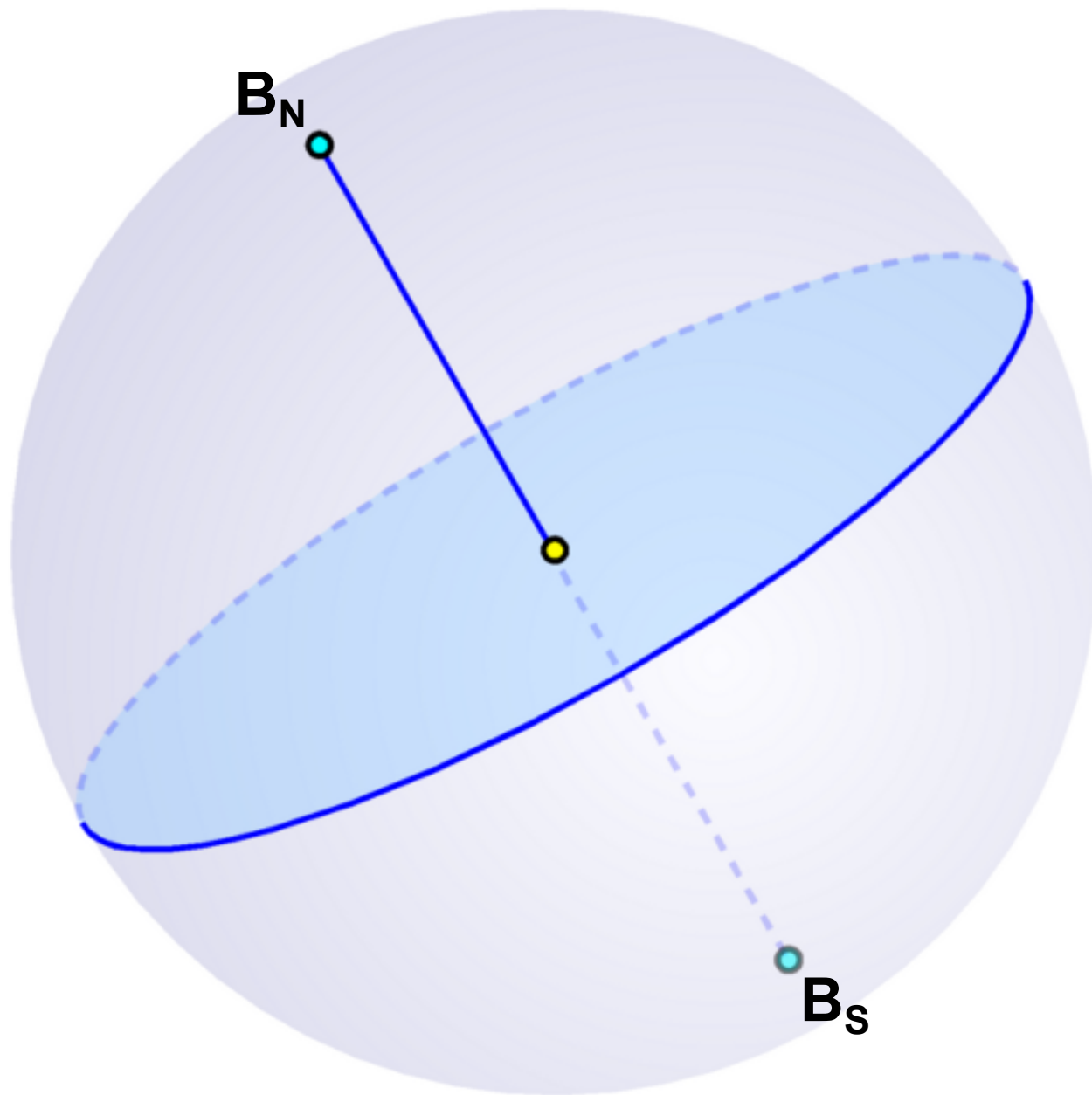


Oto układ
równikowy równonocny...









północny
biegun świata

B_N

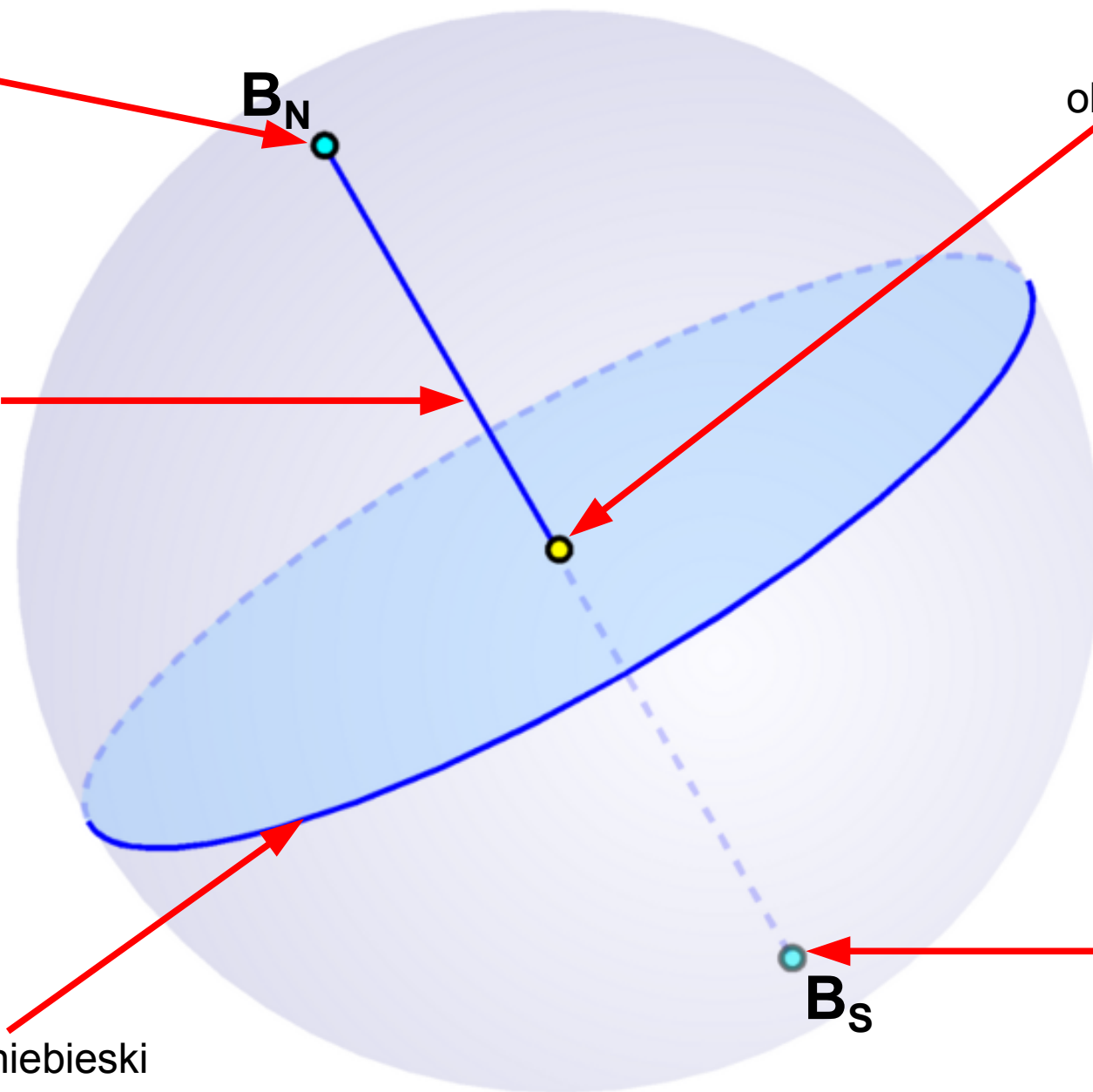
obserwator

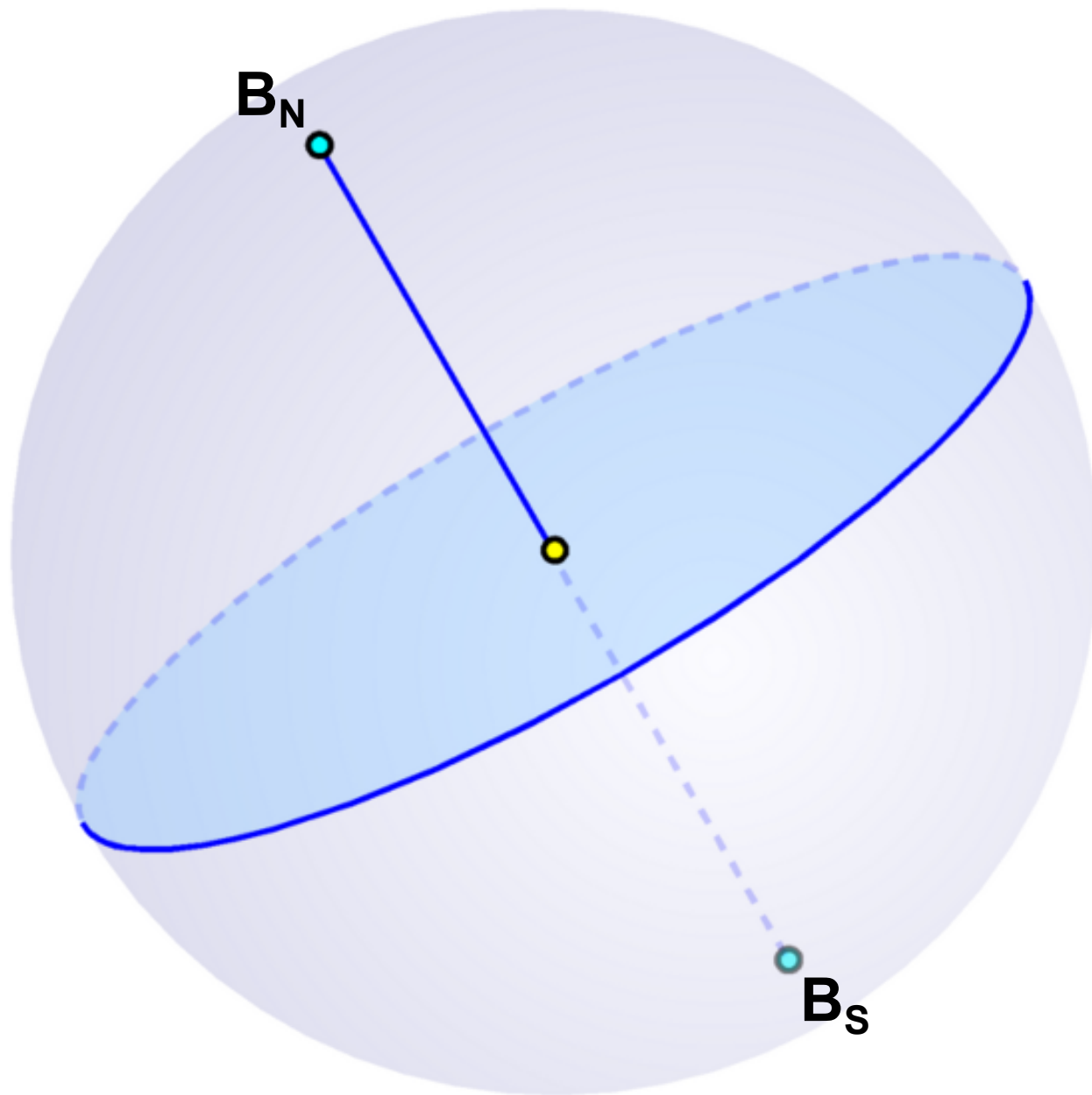
oś świata

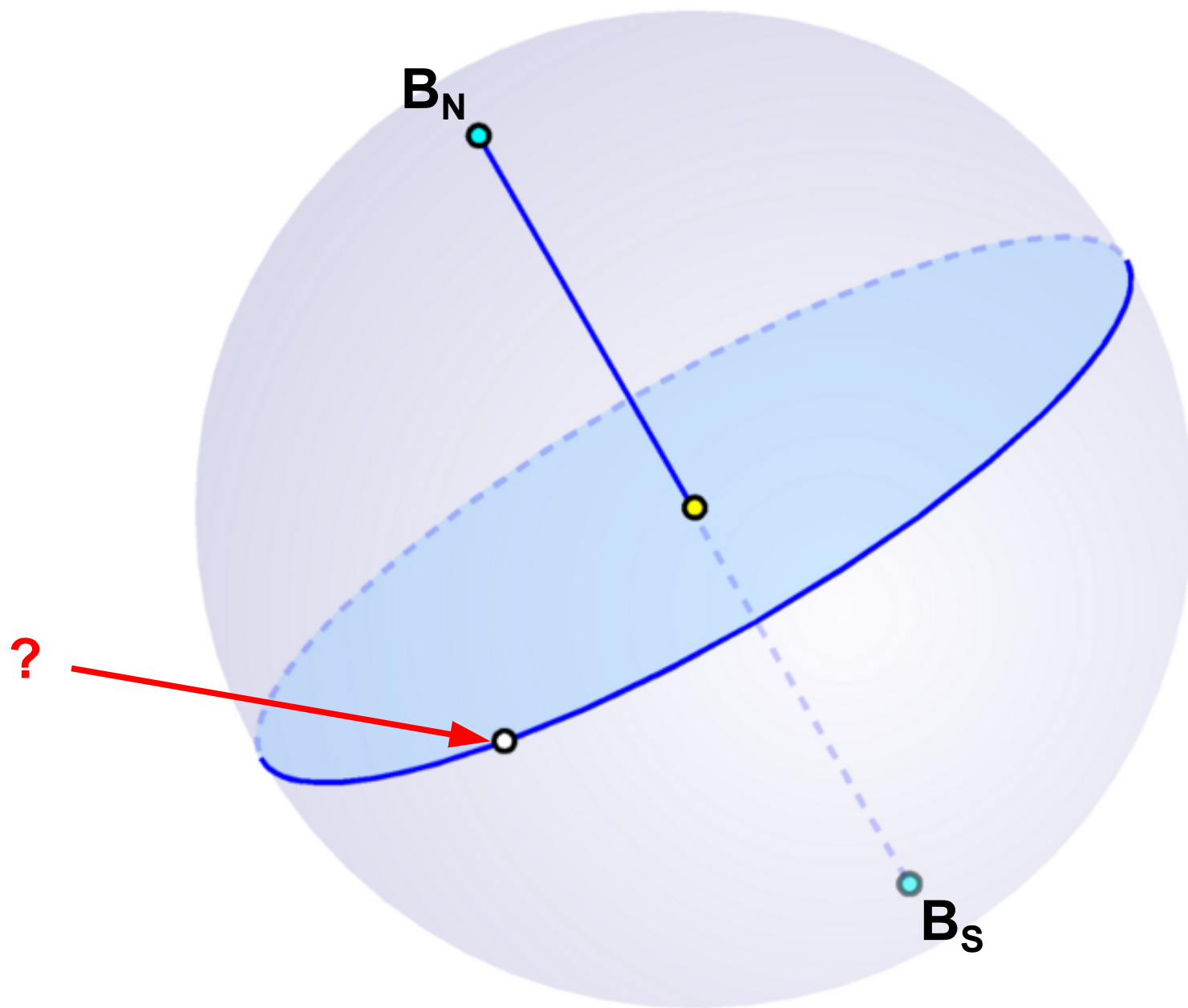
równik niebieski

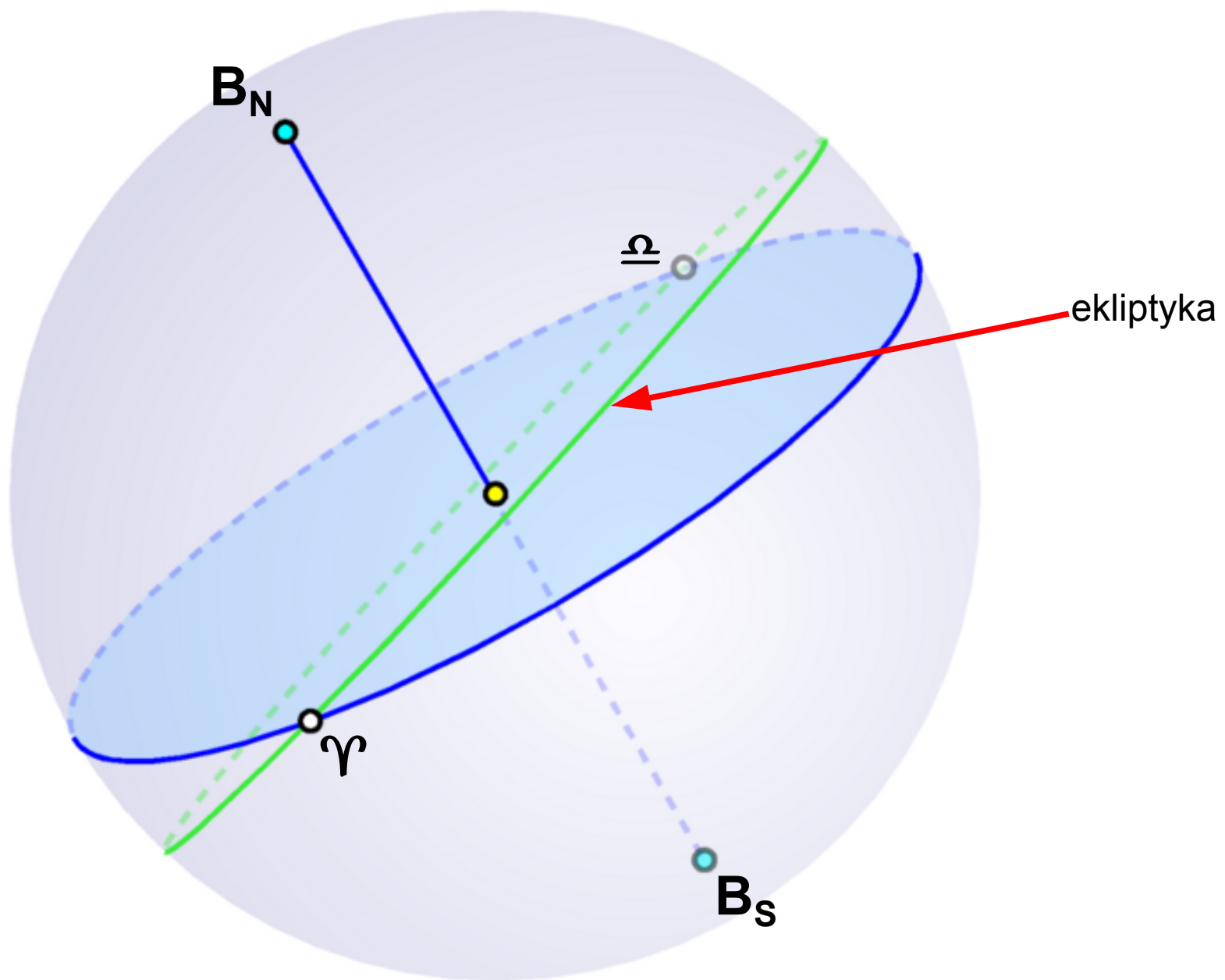
południowy
biegun świata

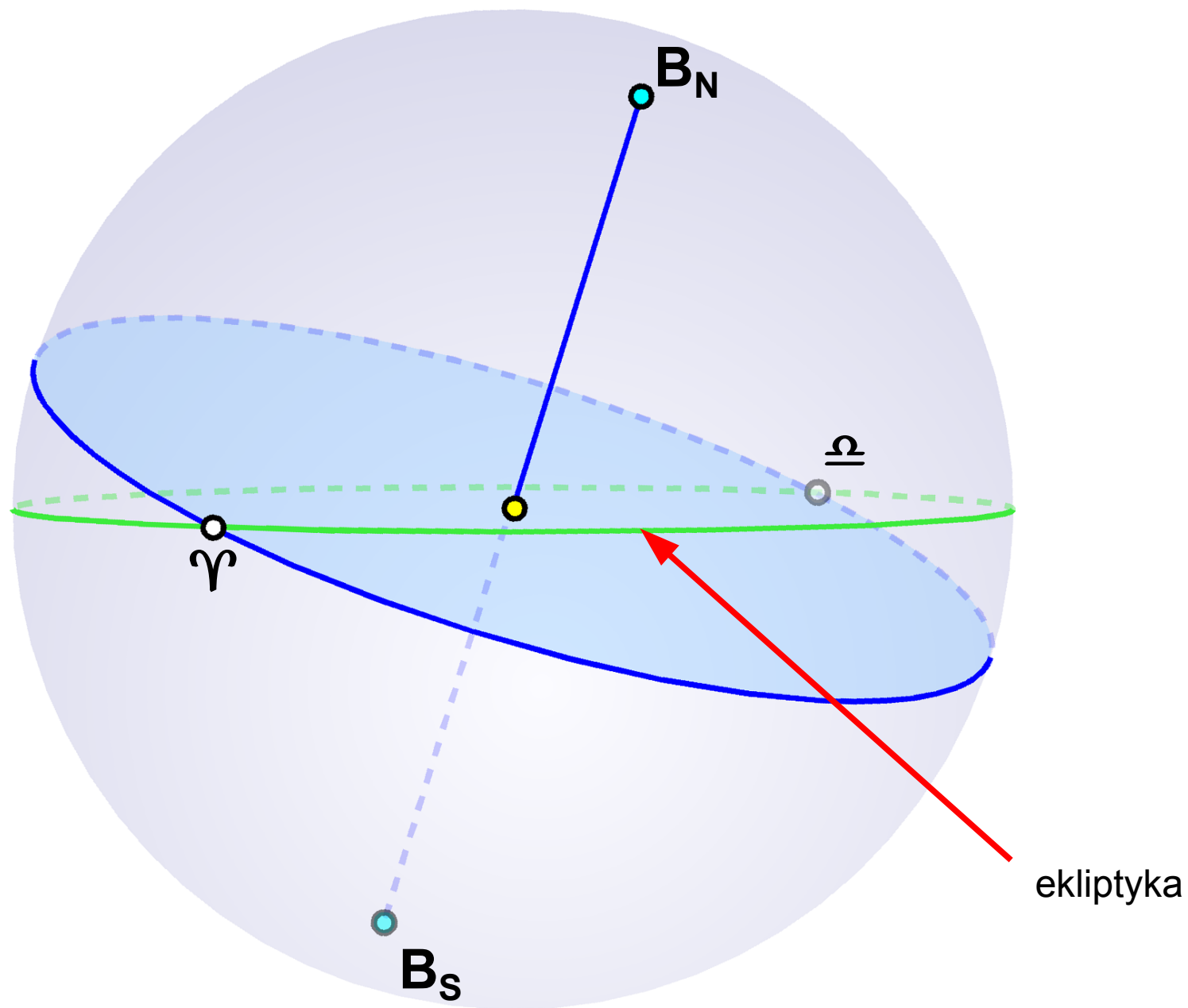
B_S

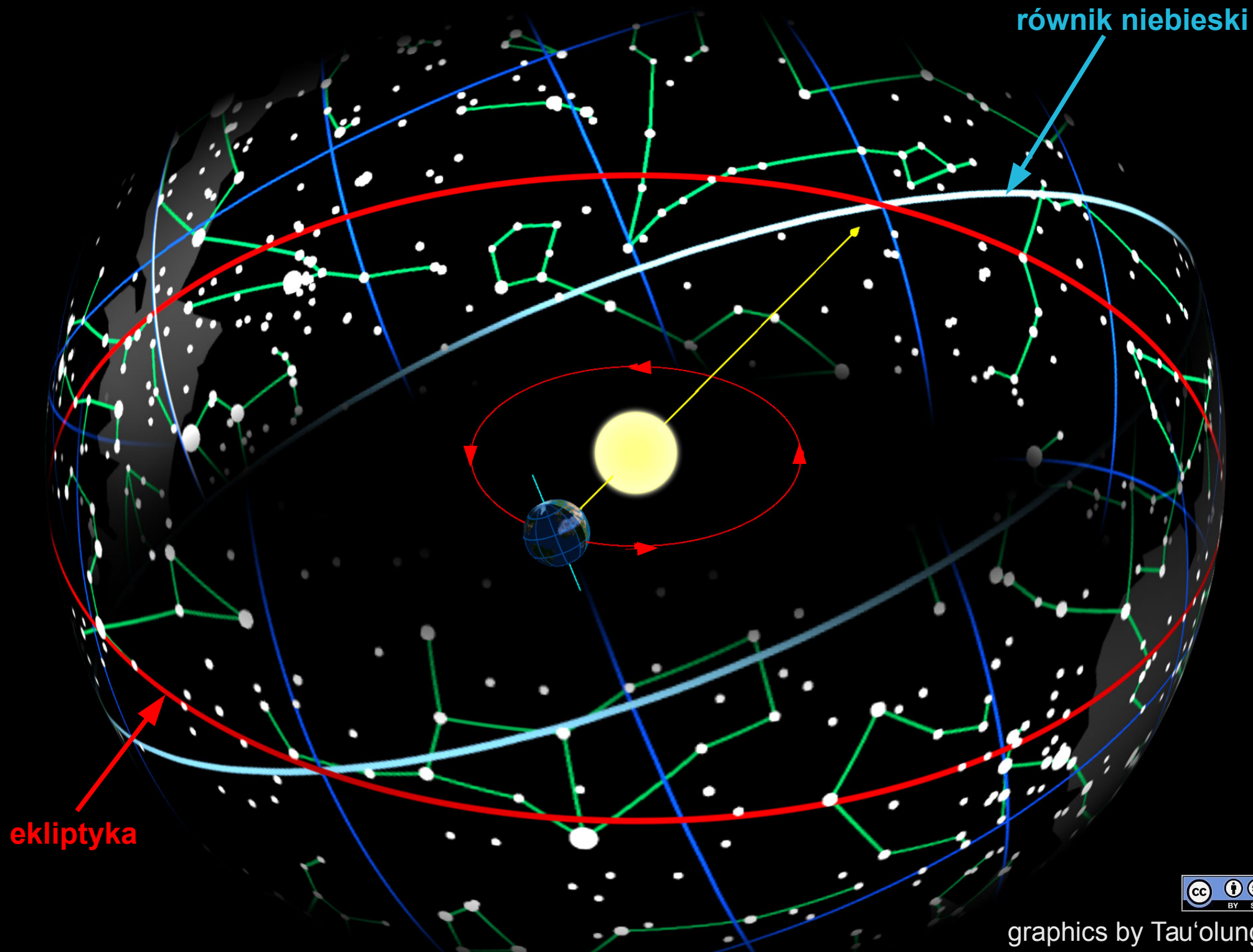


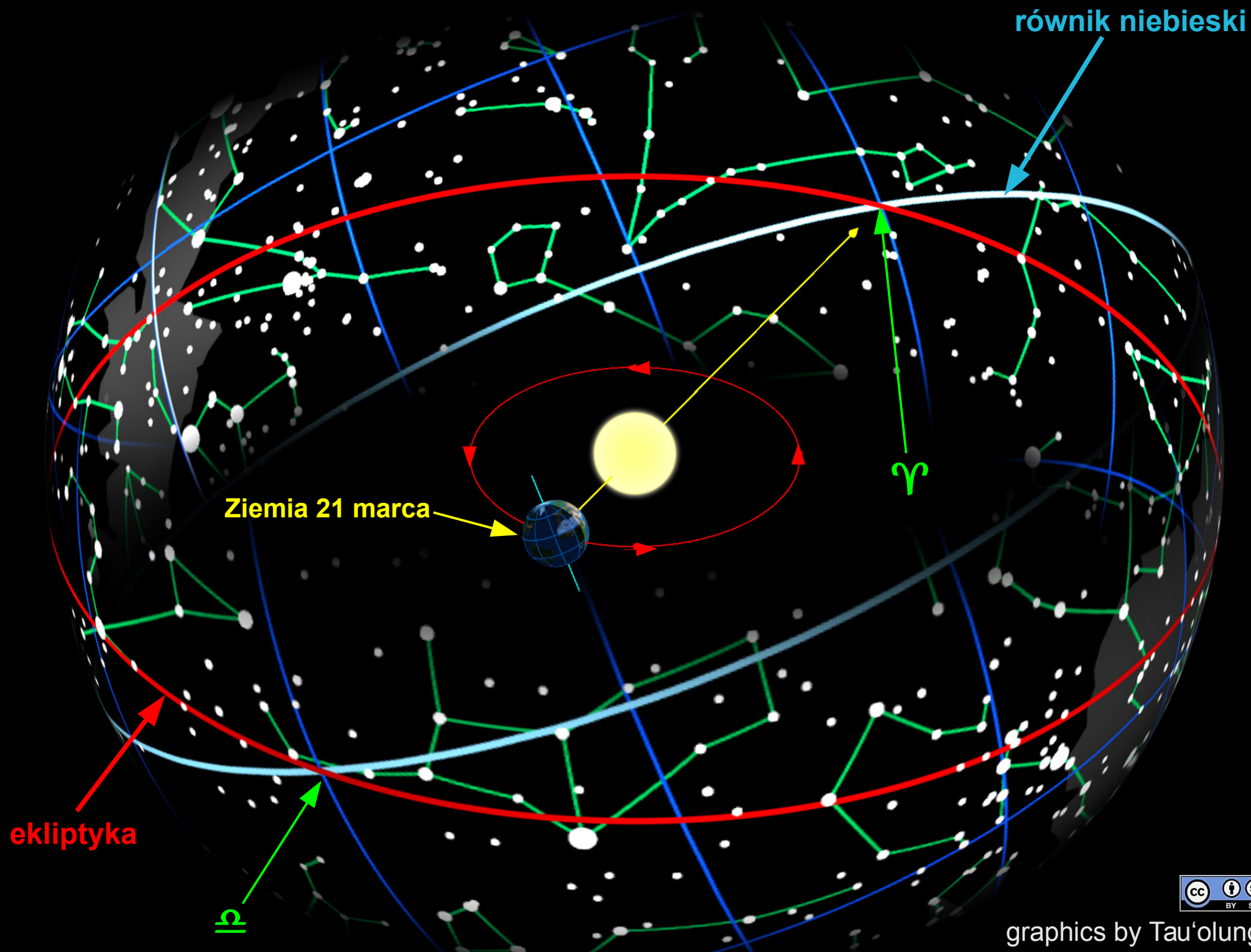


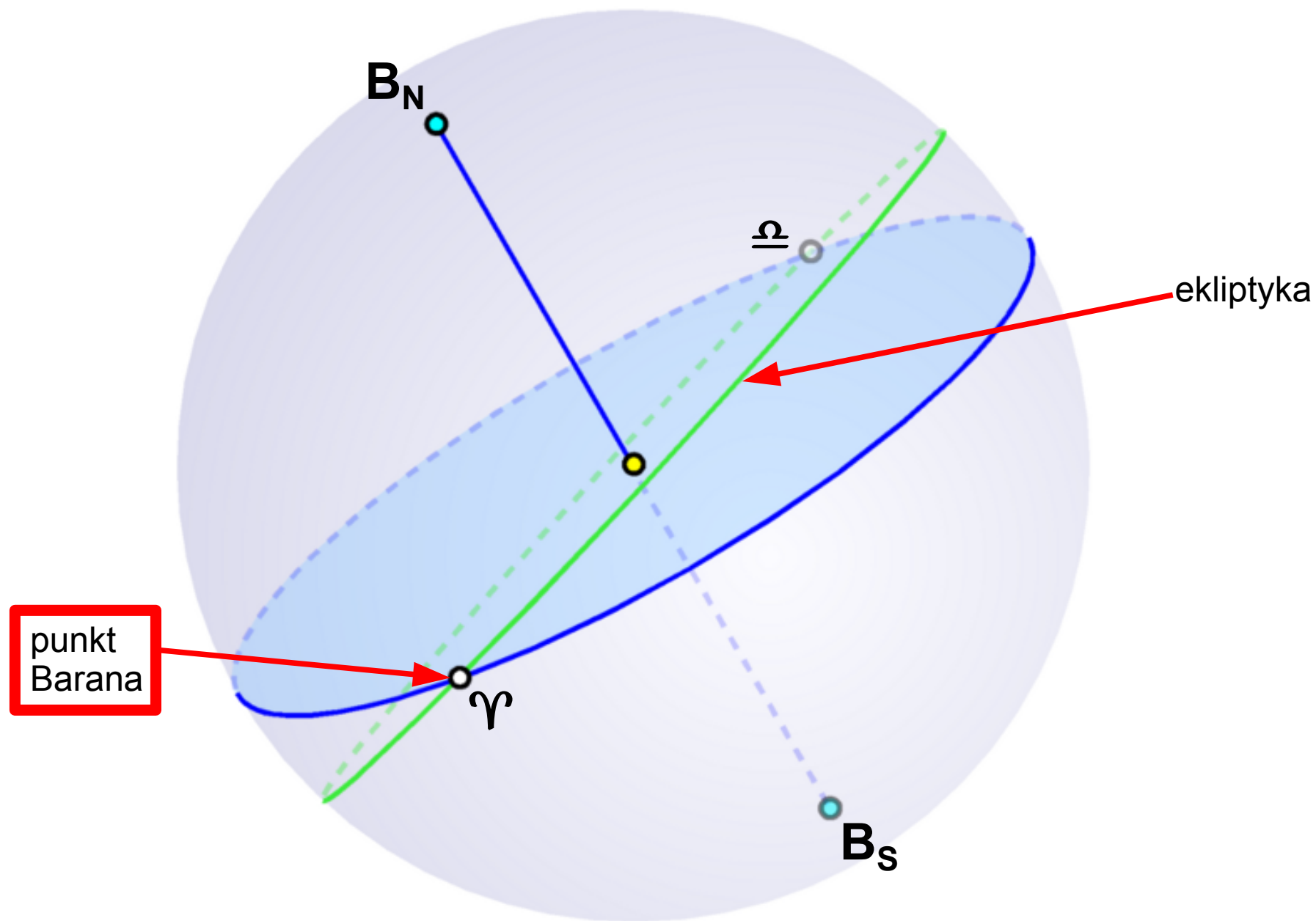






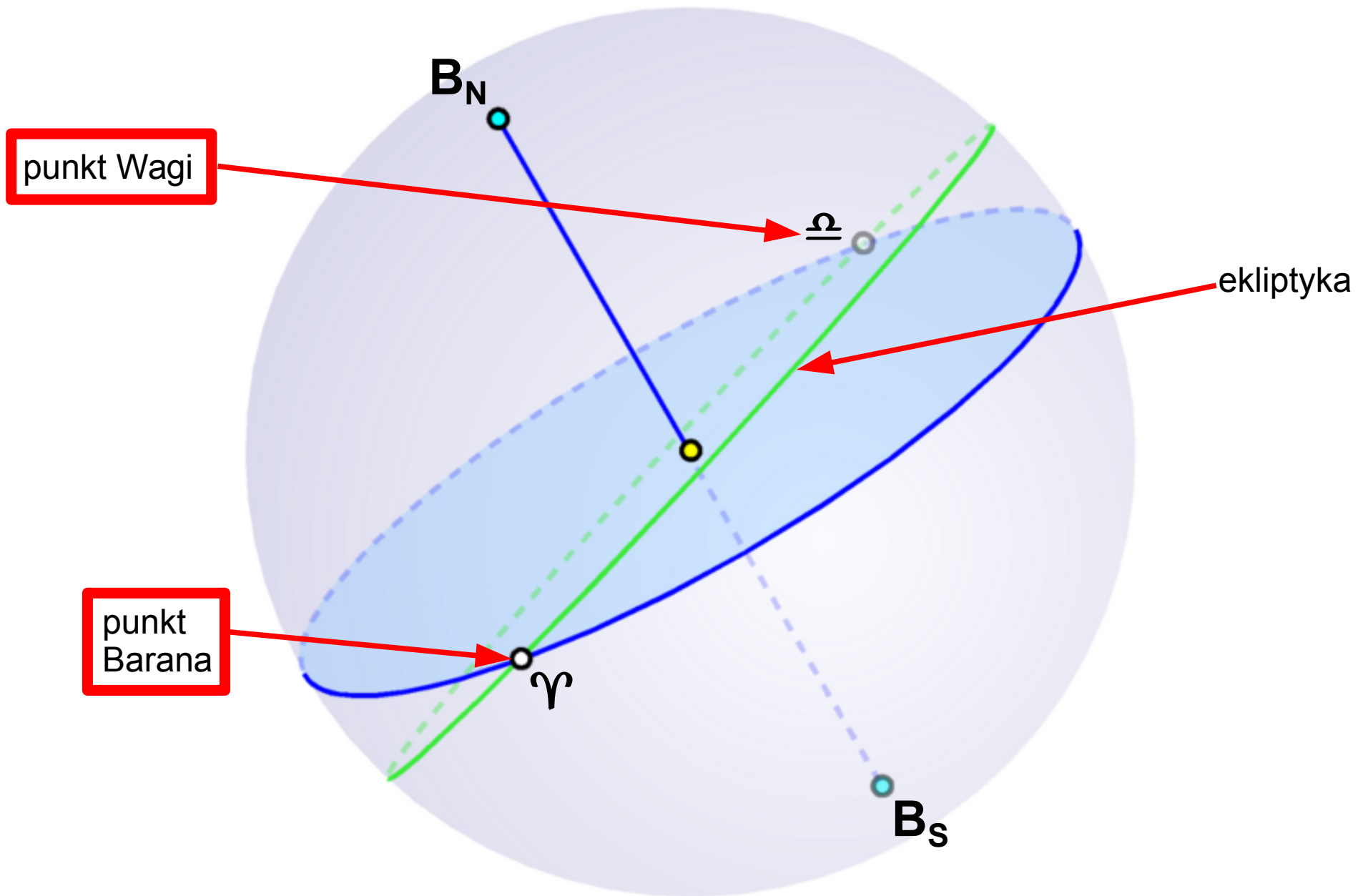






punkt Barana to punkt równonocy wiosennej

punkt Wagi to punkt równonocy jesiennej



punkt Barana to punkt równonocy wiosennej

północny
biegun świata

B_N

obserwator

oś świata

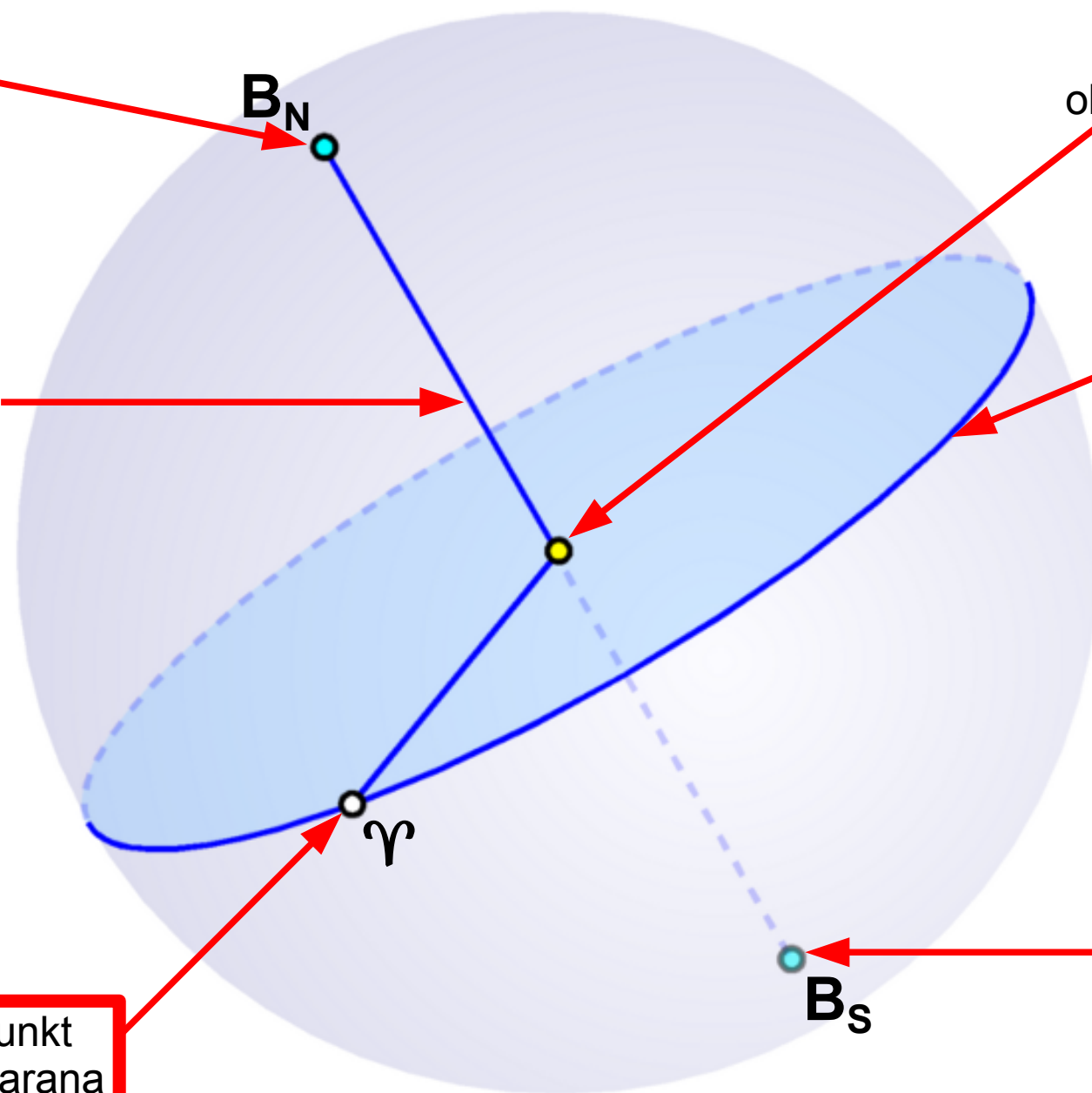
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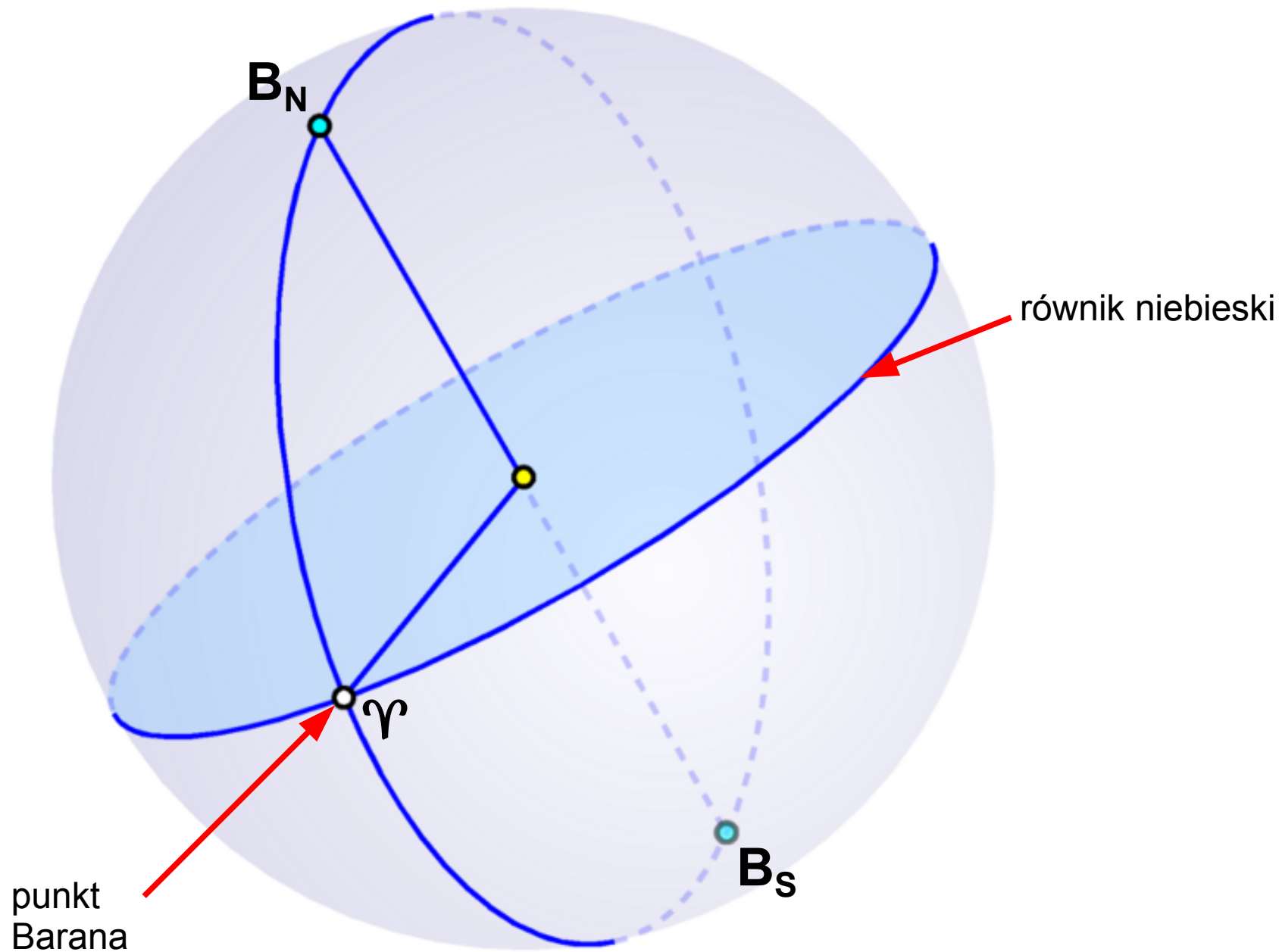
punkt
Barana

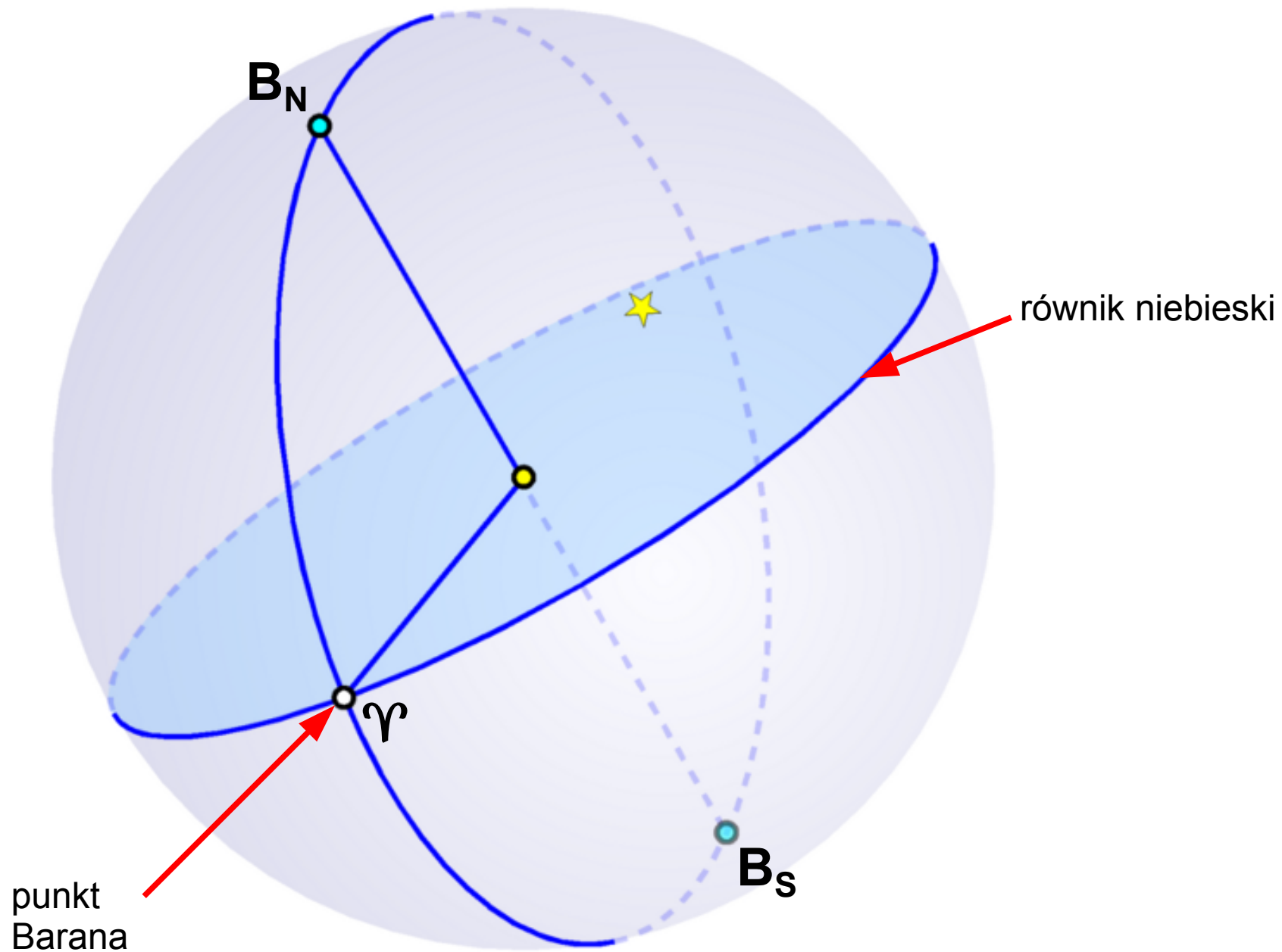
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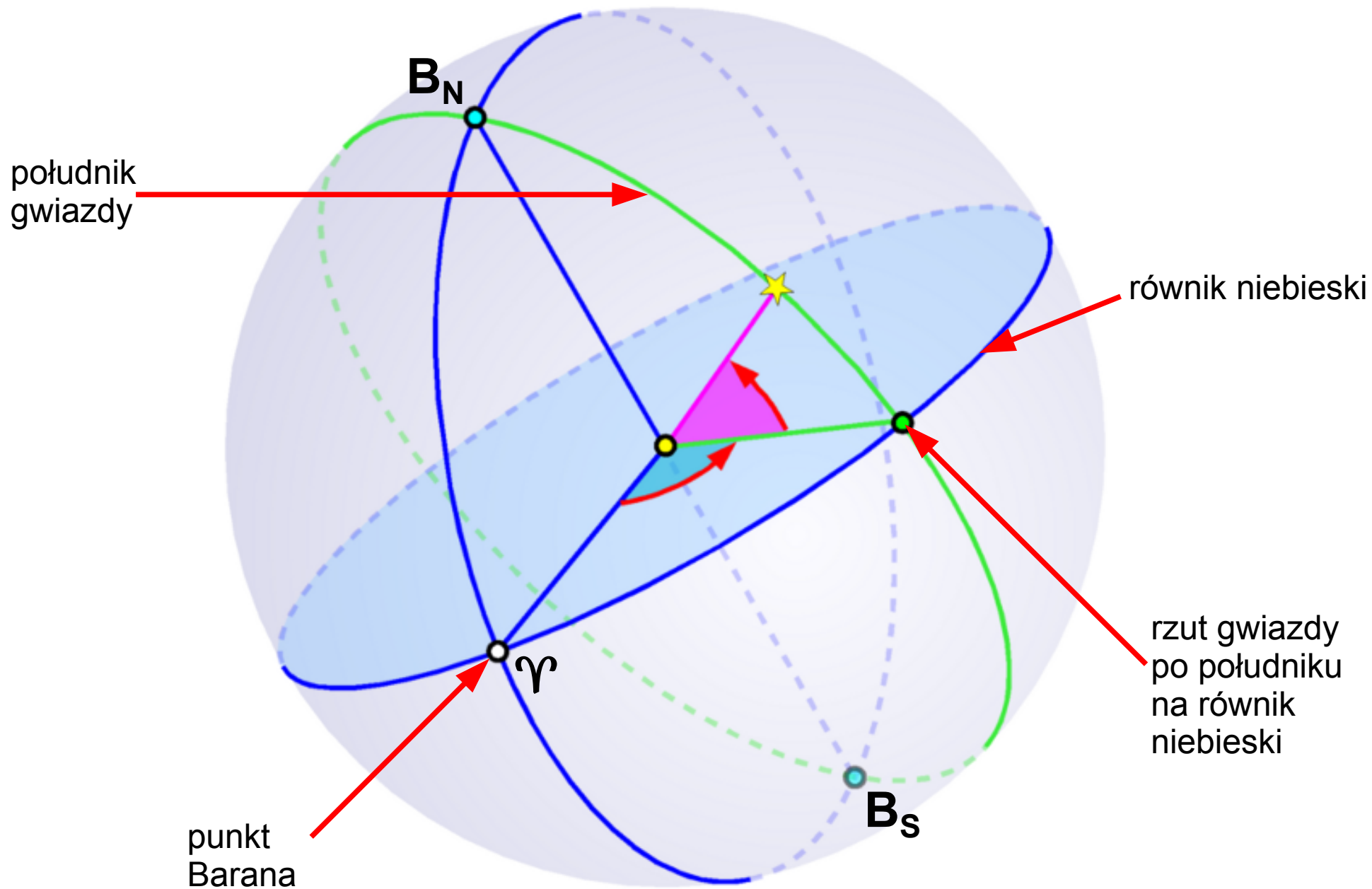
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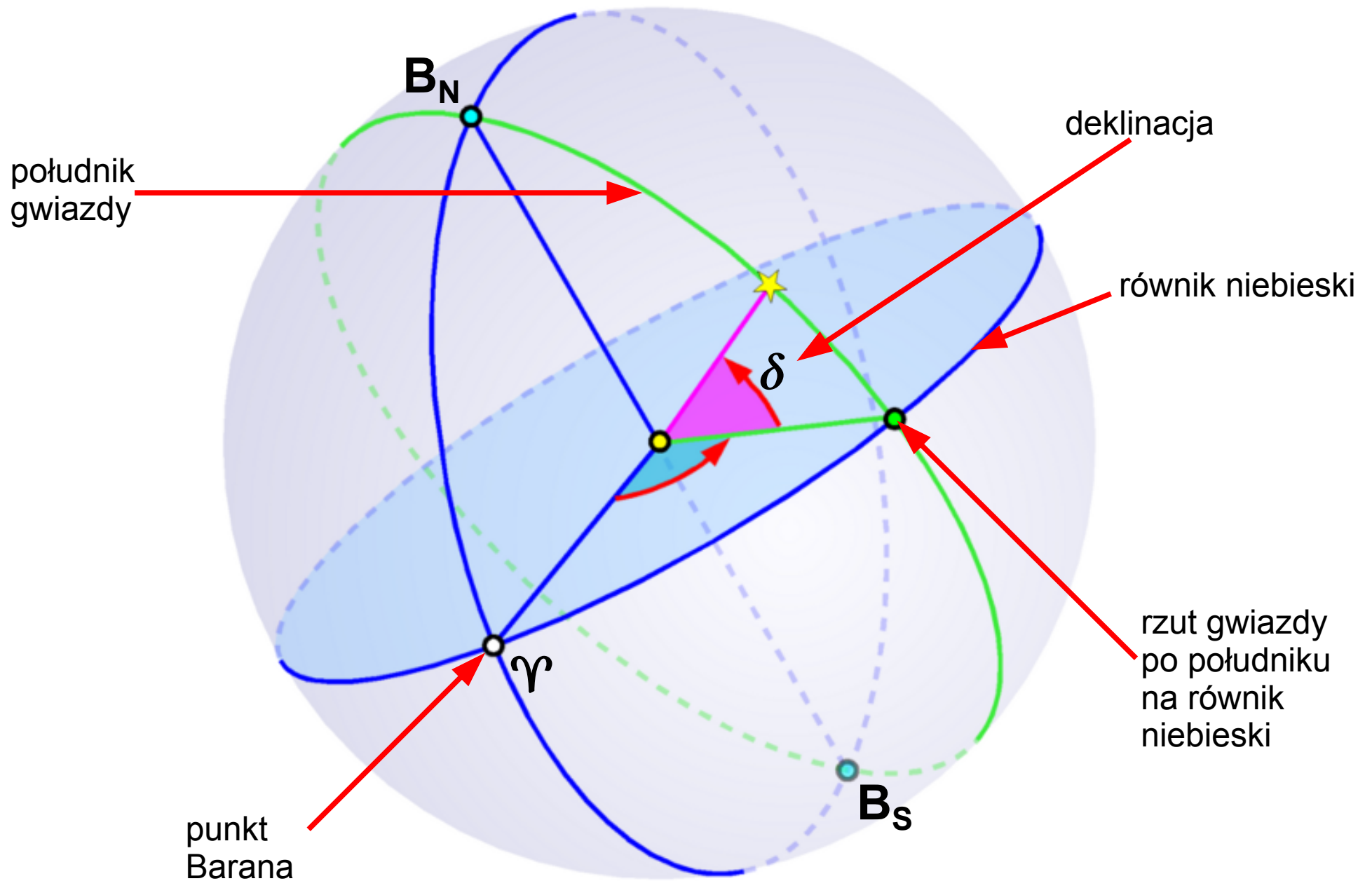
B_S



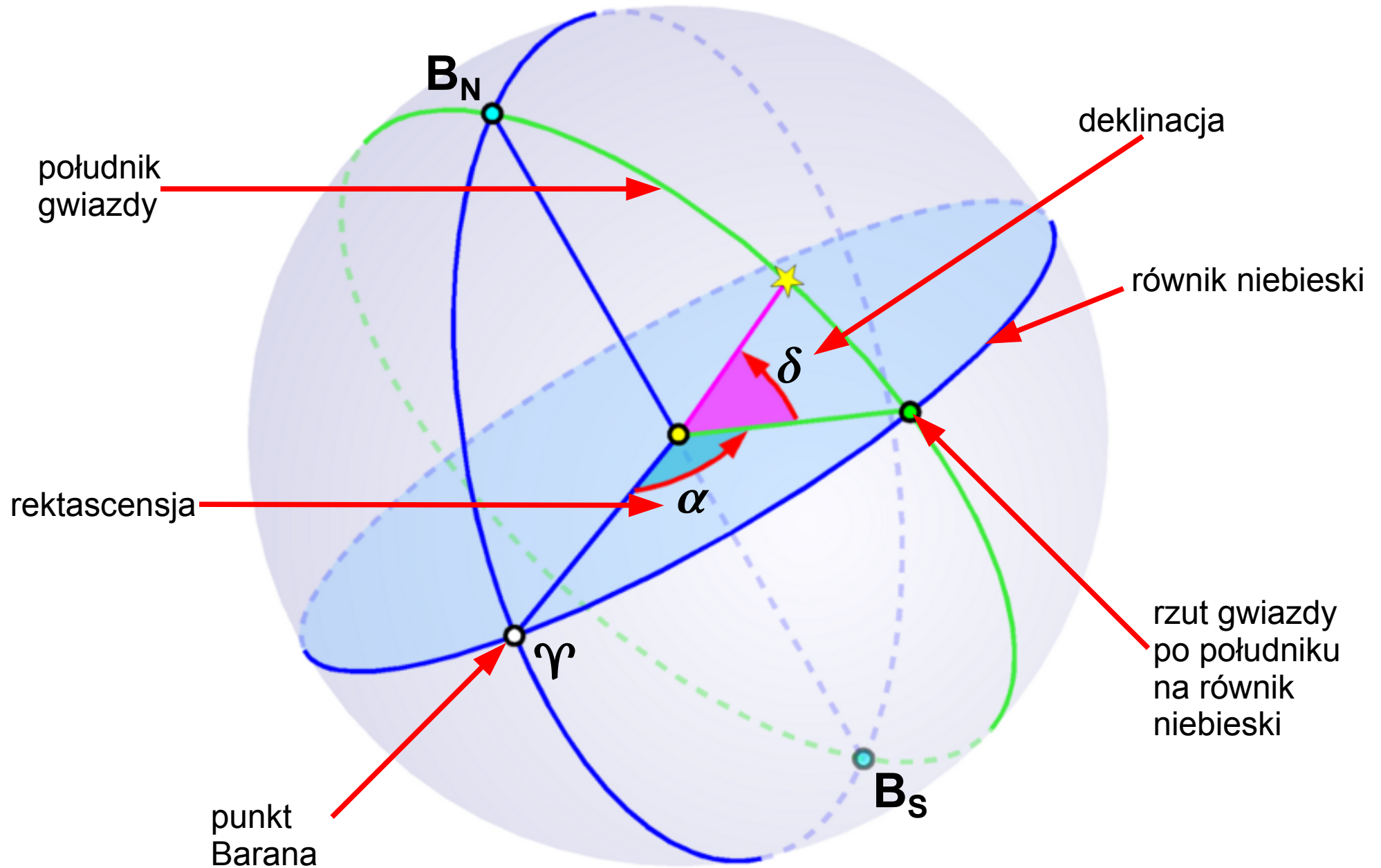




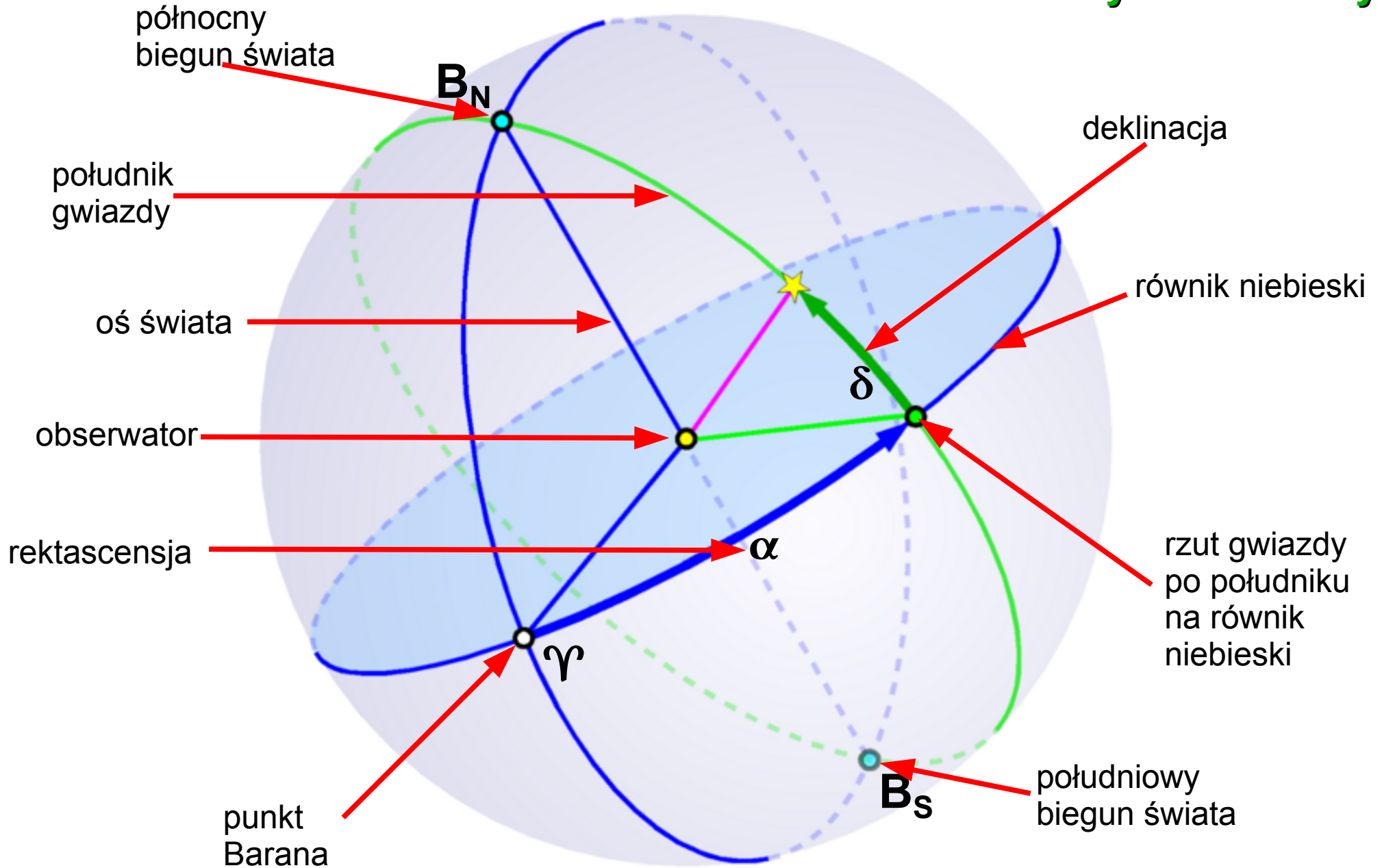




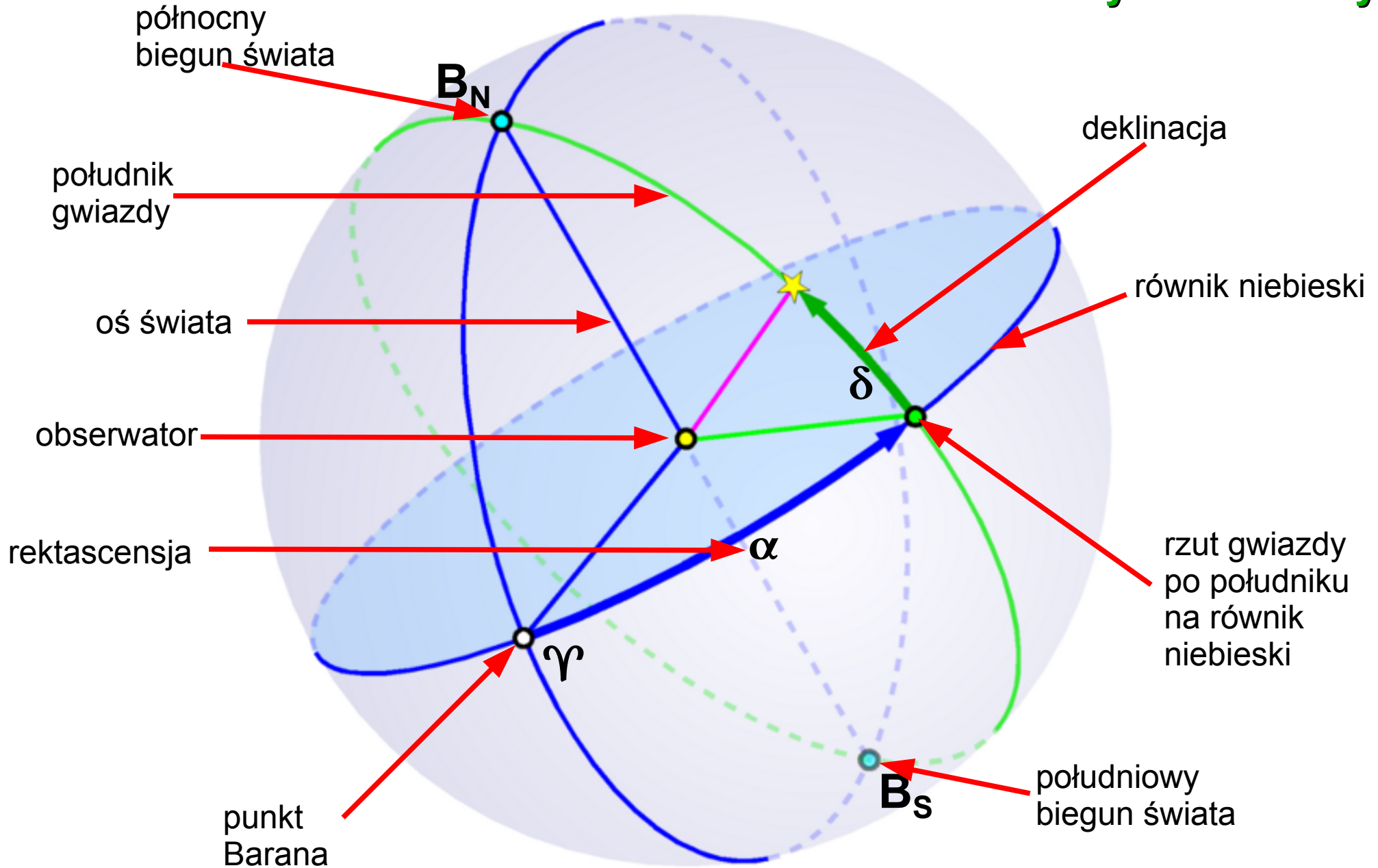
Układ równikowy równonocny



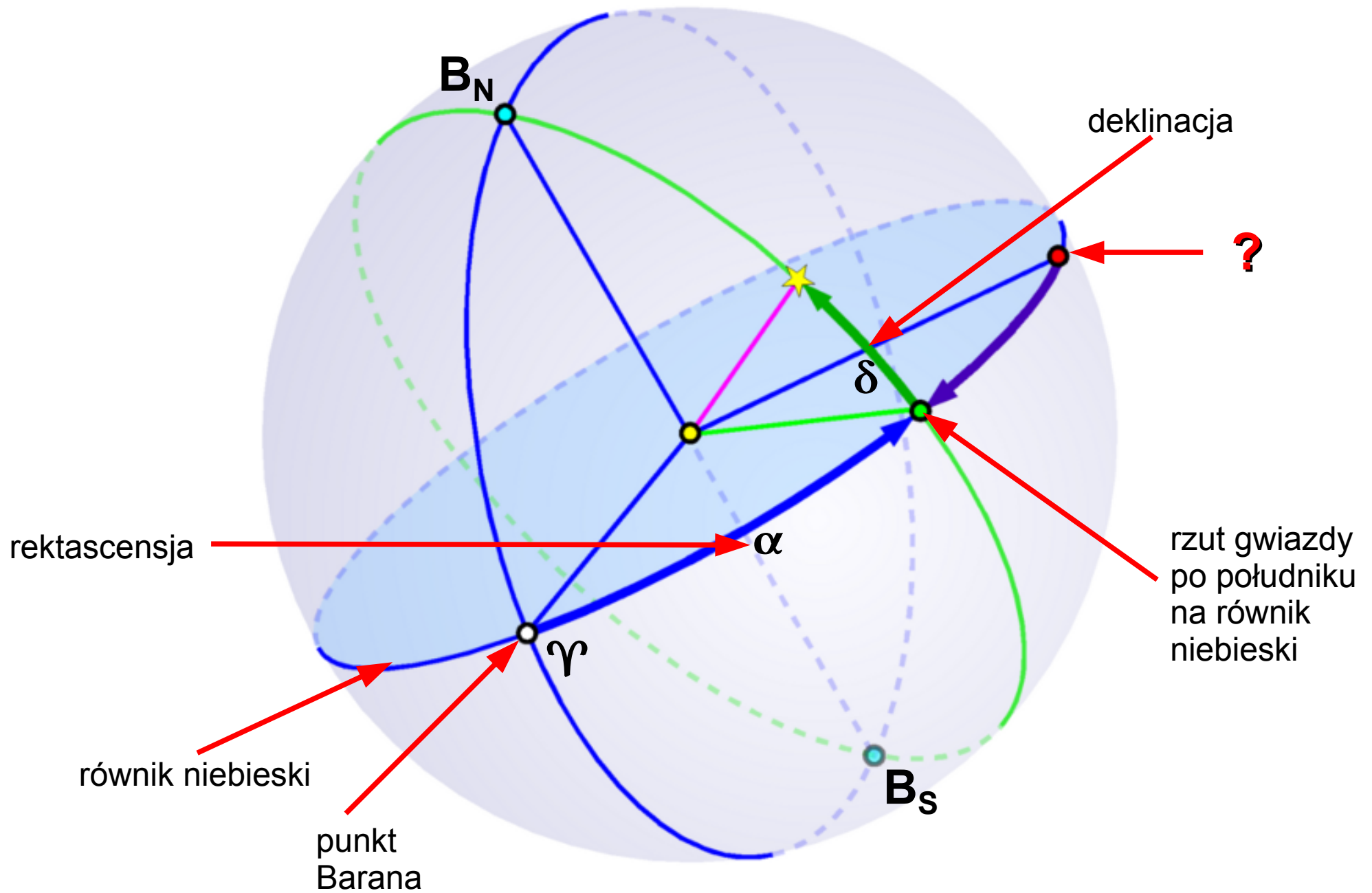
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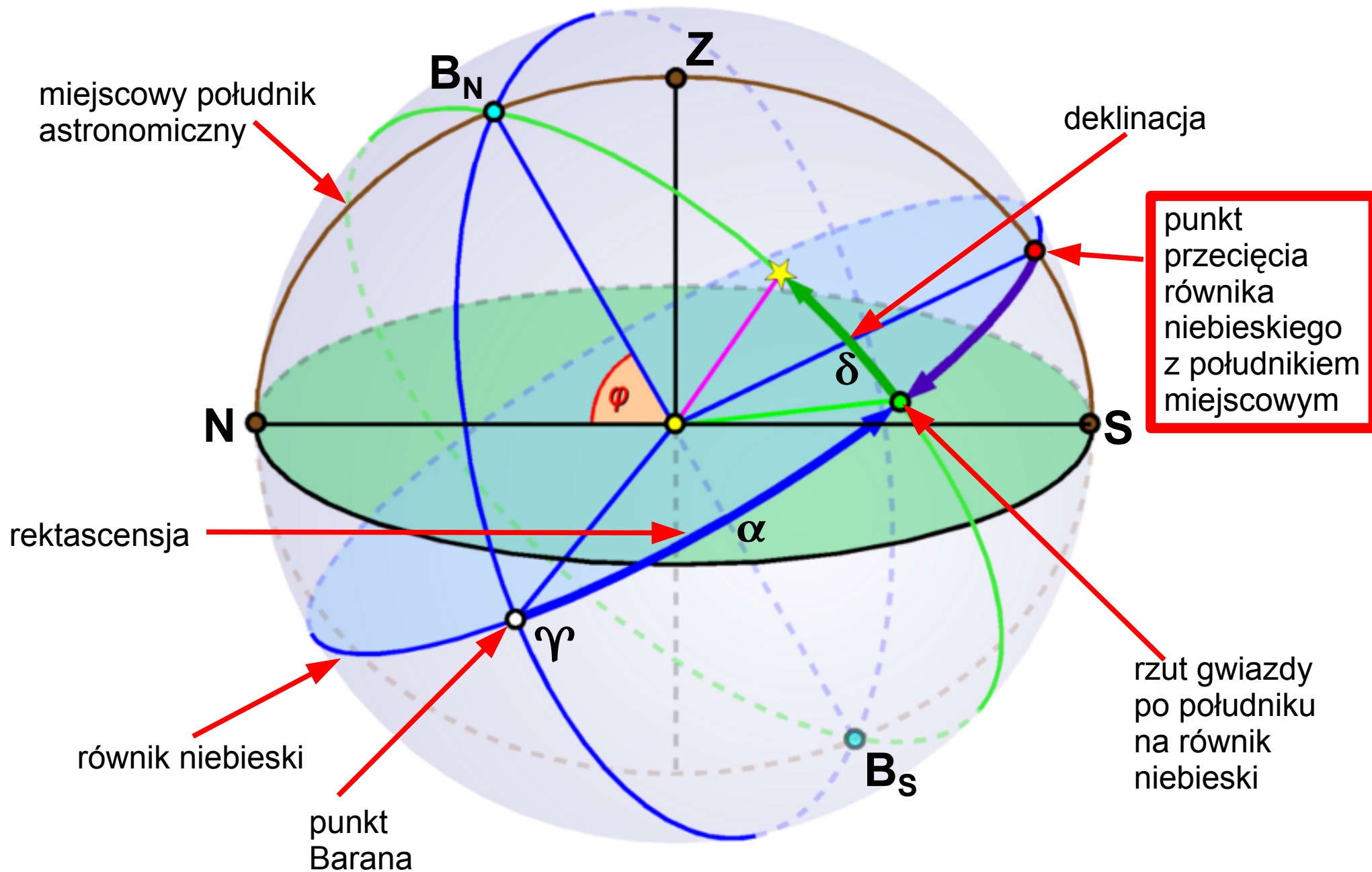


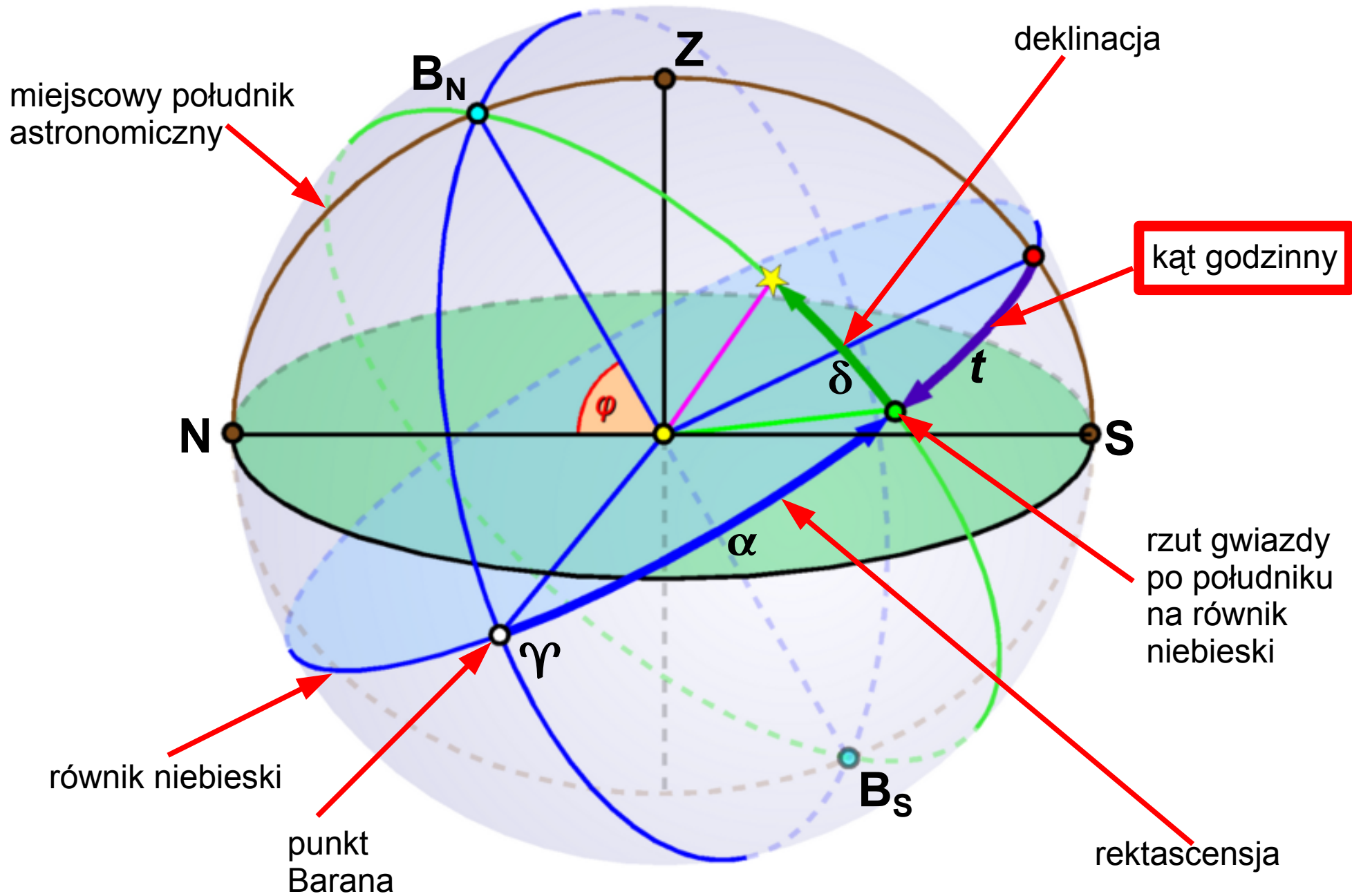
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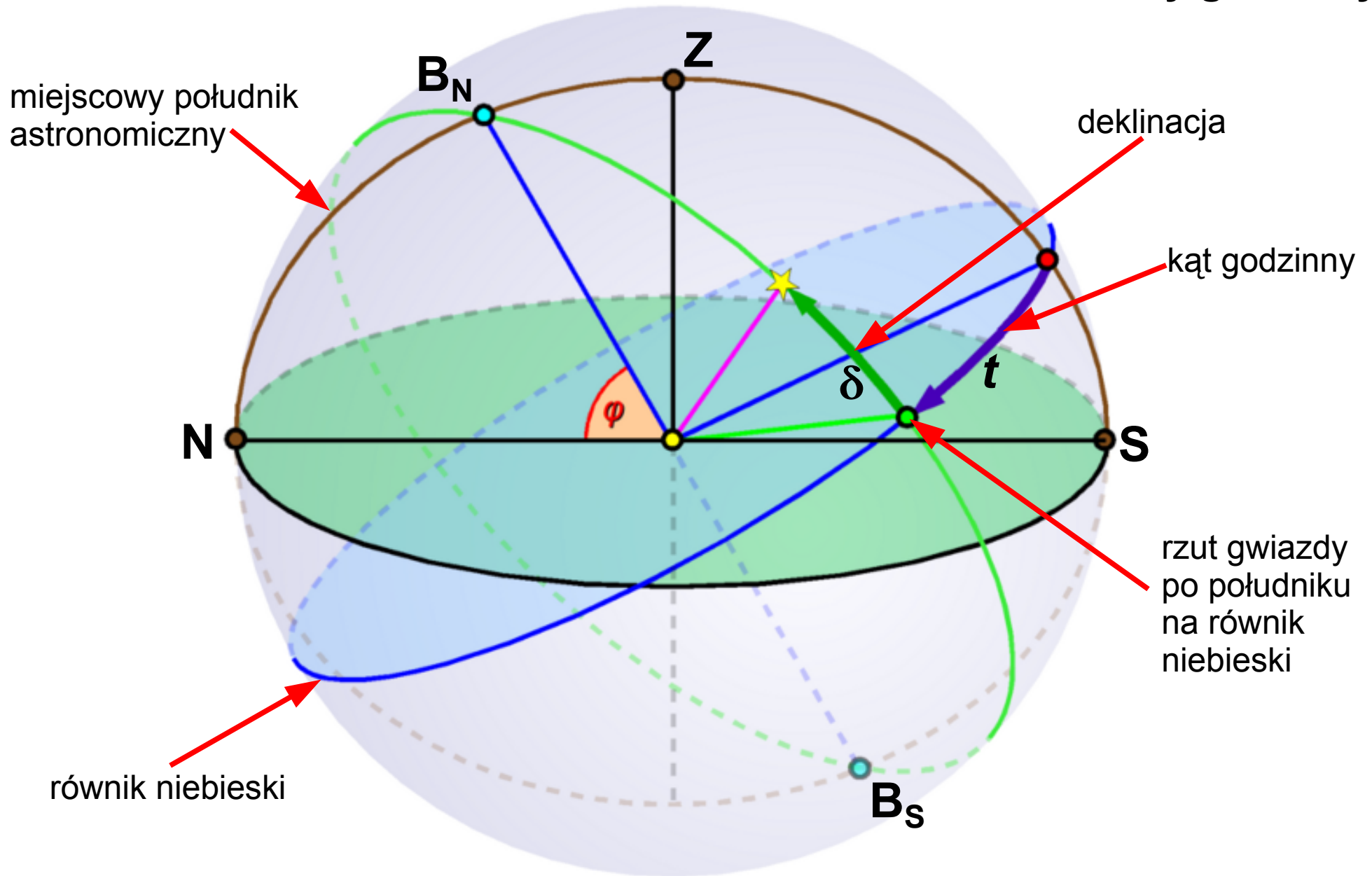
Jest to układ prawoskrętny



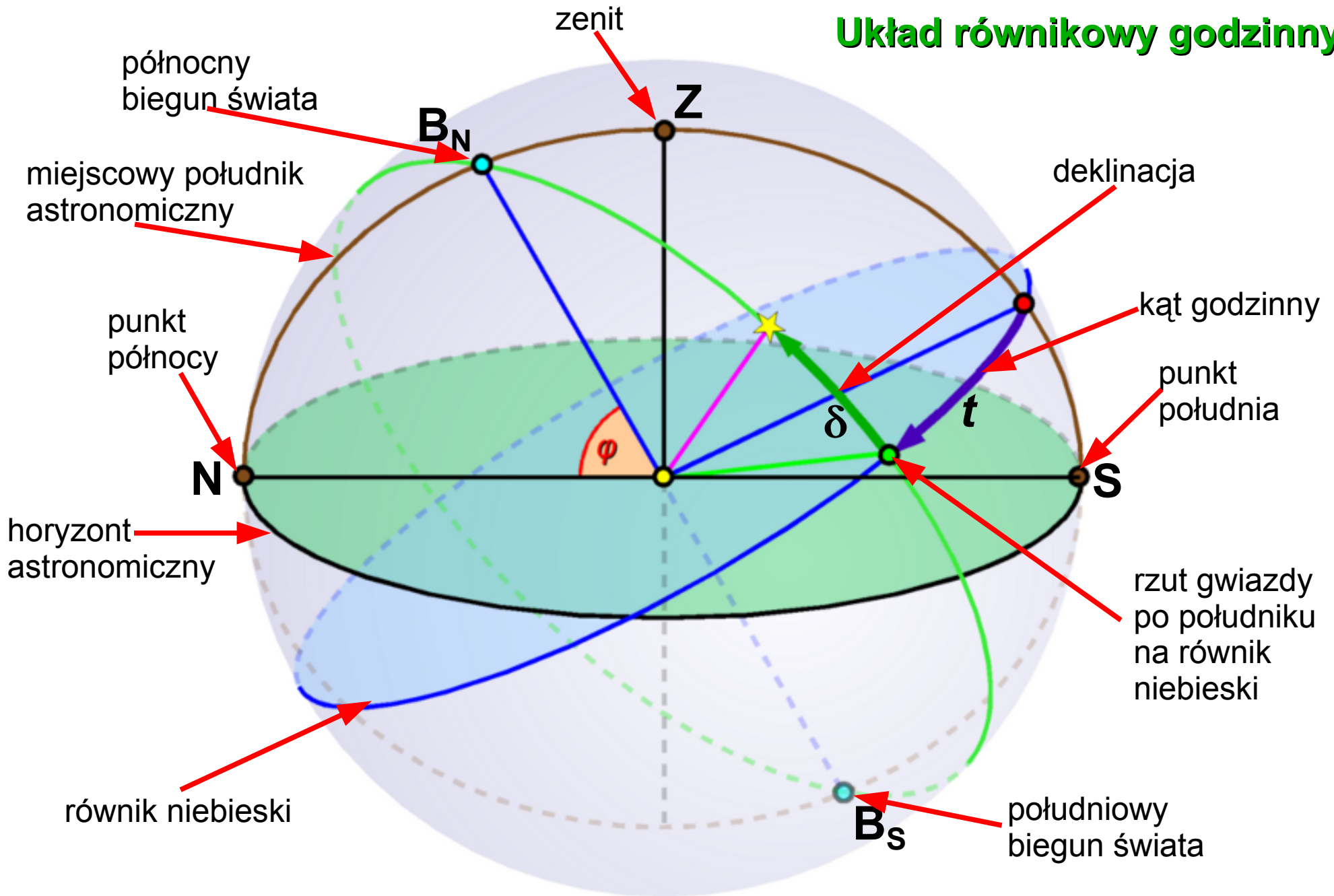




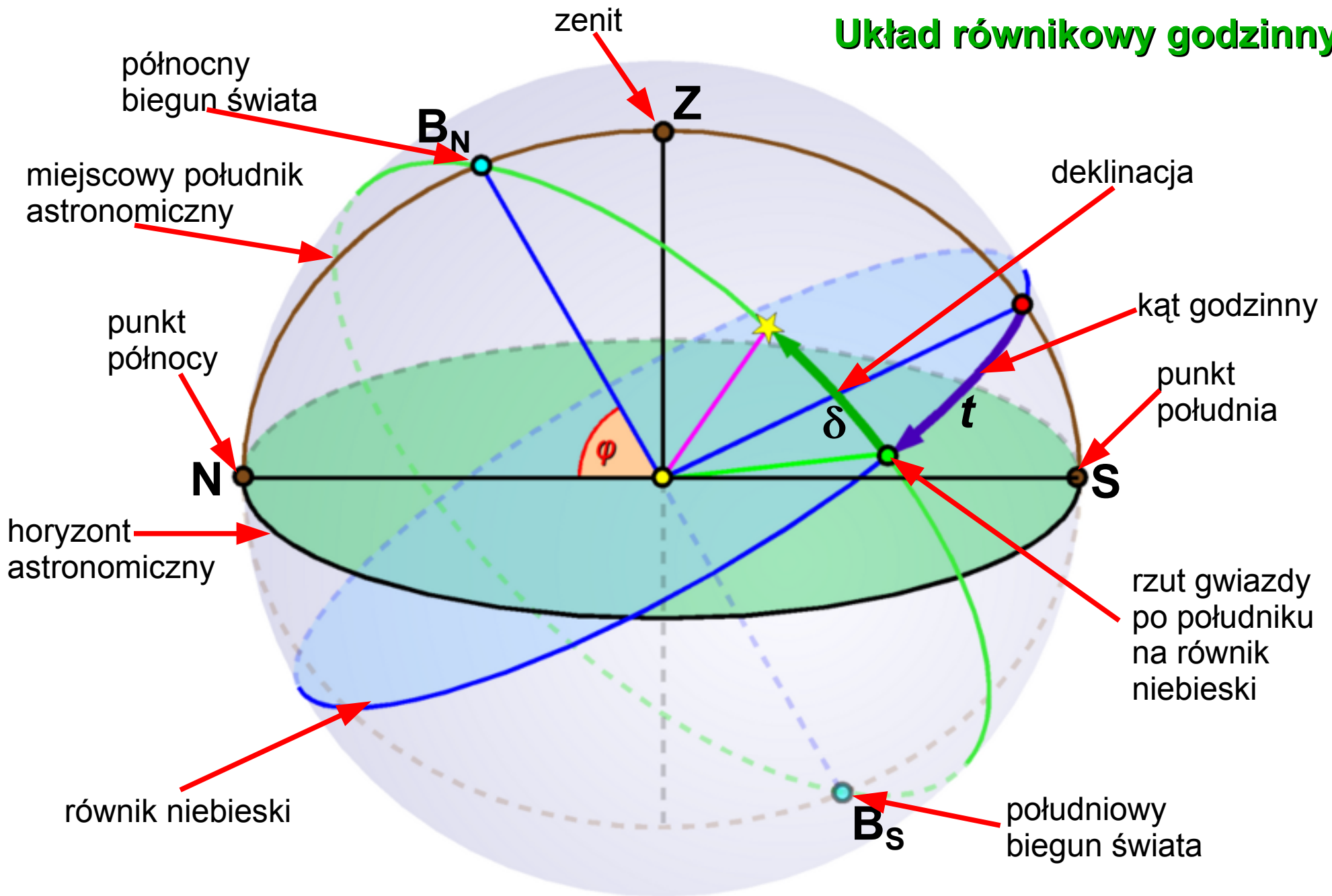
Układ równikowy godzinny



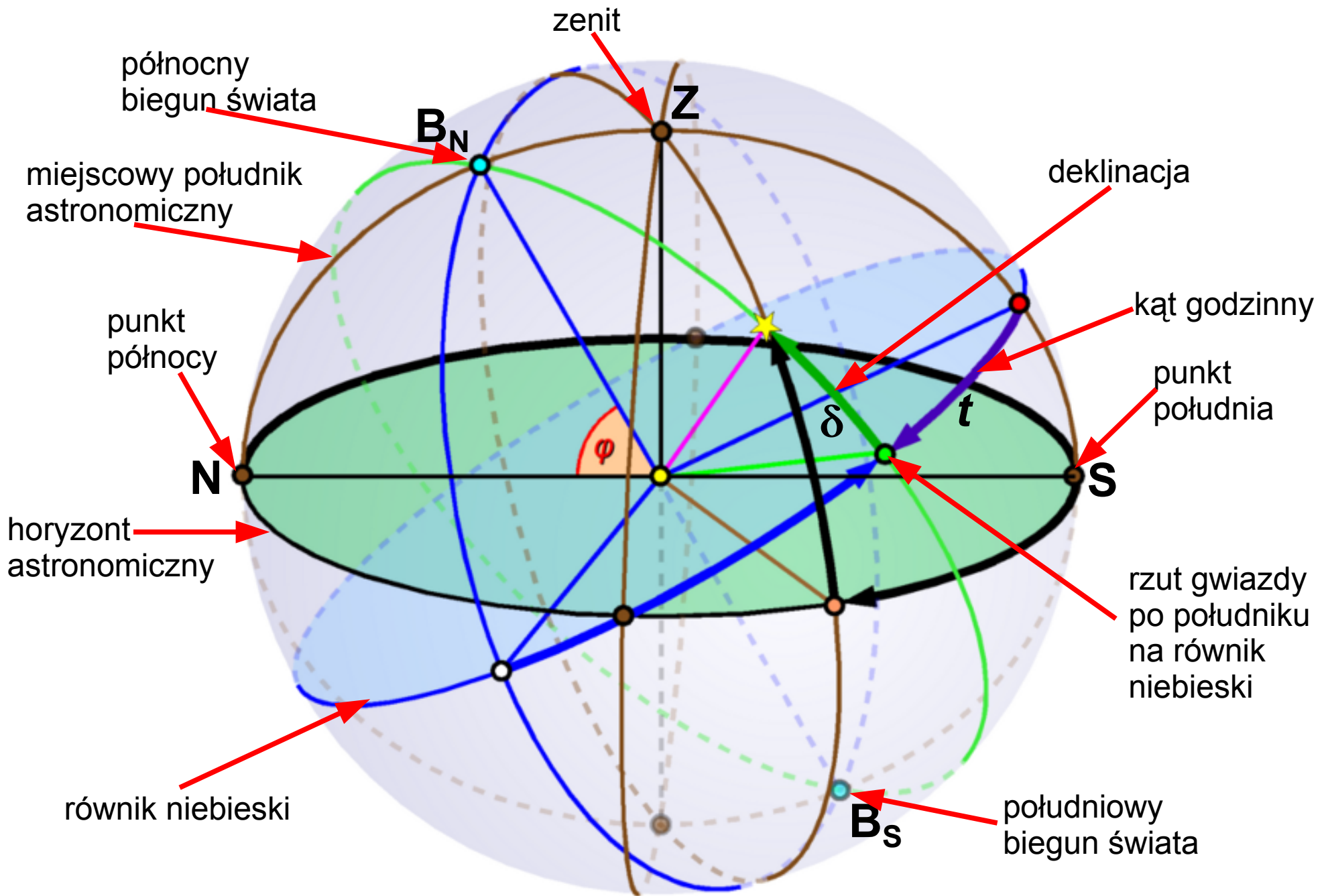
Układ równikowy godzinny



Układ równikowy godzinny



Jest to układ lewoskrętny



Oba układy równikowe oraz układ horyzontalny

